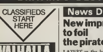
Hobbit competition — p.43

POPULAR Computing WEEKLY

35p

26 April-2 May 1984 Vol 3 No 17

BRITAIN'S BEST-SELLING MICRO WEEKLY



News Desk

New imprint to foil the pirates

LATEST in the line of software protection devices is Imprint 2 from A & F Software

Imprint 2 has been developed from a system copyrighted by Jim Lamont in 1978 It was a later anti-piracy device of his that was seized by the MoD earlier this year

The device is incorporated into the program in two stages, the first during the actual writing and the second at the duplication stage Anyone who makes a copy of a protected program will find that it crashes while loading

"We are 99 per cent certain that people won't be able to get round this device," said Mike Fitzgerald of A & F "A lot of people are going to try very hard to do so, but they'll find it extremely difficult."

Jim Lamont has successfully applied for a patent for Imprint 2

A & F is not the only company to be developing his idea, but it is the first to produce a completed version

"A number of software houses are interested in our version," Mike Fitzgerald con

continued on page 5 ▸

Relative details from Einstein

TATUNG has now announced full details of its new micro — the Einstein — planned to be available in July

Aimed at both the home and small business markets, the Einstein is priced at £499 The machine is Z80A based, has 64K Ram plus 16K video Ram and an 8K Rom (expandible up to 32K) This is broadly the MSX hardware standard

The Einstein also includes a single built-in 3 inch Teac disc drive The unit has a formatted capacity of 400K (200K per side) Just over 43K is available from Basic after it has been loaded from disc

It has a professional keyboard Display is either 40 or 32 by 24 columns in text mode and 256 x 192 pixels in graphics mode The machine has 16 colours with a colour resolution of any two colours per 8-pixel row Up to 32 sprites can be displayed A three channel sound chip is included

The machine has a Centronics port, an RS232, two analogue ports, an 8-bit user port and YUV and UHF tv connections

Up to three additional disc units can be connected (the

continued on page 5 ▸



This Week

POPULAR Computing WEEKLY

26 April-2 May 1984 Vol 3 No 17

SUNSHINE

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How to submit articles
Articles which are submitted for publication should not be more than 3 000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted.

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

This Week

Editorial

The Hobbit is undoubtedly a classic micro adventure game. Indeed, there is almost a danger that so many people have sung its praises that users are starting to become slightly bored with it.

However, *The Hobbit* still remains a landmark in computer history for the way in which it brought together elements of artificial intelligence, graphics and interaction to produce an adventure which captured a good deal of the flavour and imagery of the original book on which it was based. The game may look a bit dated now, compared to some of the adventures which are coming on to the market, but at the time it was released it was a long way ahead of anything else.

A lot of the praise for this program is due to Fred Milgrom and his team of Melbourne House programmers. But, praise is also due to Tolkein, for without his book there would be no program.

The explosion in home micros, and the accompanying software expertise that has grown up around it, has made it possible for all manner of worlds to be brought alive in your own living room. But, the nature of those worlds still depends on those with the imagination and skill to conceive them.

With programs such as *The Quill* and *Games Designer* starting to emerge, the importance of original thinkers is likely to grow.

Next Thursday

Play Solitaire — next week's star game for Dragon 32 by J Bateman — the game that is usually played with pegs or marbles.

QL non-appearance explained

THE reason for the spectacular non appearance of the Sinclair QL has now been made clear

Soon after its January launch it became obvious to Sinclair's design team that the on-board operating system, SuperBasic and QDOS disc operating system software was not going to fit into the 32K Rom allocated for it in the hardware design.

In addition, Sinclair decided to further extend the software to include extra facilities such as turtle graphics

With too much machine-code to squeeze into the Rom, Sinclair has decided to put a portion of it on to a separate chip

First machines — which Sinclair has now promised will be in the hands of customers by the end of this month — will go out with the overflow' software provided as a separate Eprom board which will have to be plugged into the Rom cartridge port at the rear of the machine

Later versions of the machine will heve the software built into the main Rom, incorporated inside the computer, freeing the Rom cartridge port for the purpose for which it was intended

People who receive the plug-in Eprom version of the QL will be offered a hardware up-grade later — well before Rom cartridge software appears for the machine

Because the QL design has a fixed 64K Rom address space, the larger-than-32K internal Rom will mean that the maximum size of cartridge software will be only 16K

Explaining the decision to deliver first machines with a sideways Eprom board, Sinclair's spokesman said "As far as customers are concerned, they want the machine they thought they were buying as soon as possible — and this is a way of doing that "

Sinclair now has over 13,000 waiting customers — four thousand more than at the end of February.

The form of compensation to be offered to waiting customers has also been sorted out Each waiting QL customer — regardless of whether they have ordered by cheque or credit card — will receive an RS232 printer lead which retails at £14 95 Those who originally ordered a printer lead will get a refund

● *PCW*'s QL order Week 14 Delivery is now scheduled for the end of April

Einstein

◄ continued from page 1

first costs £190) and an optional colour display will be priced around £240

No details are available so far of which chains will stock the machine

Although the micro's Tatung/Xtal disc operating system is claimed to be CP/M compatible, being a 40-column only machine the Einstein will only work with software written for a 40-column display A+F, Crystal and IJK are writing a limited amount of games software for the machine but it will not be cheap, necessarily including the cost of a disc

The Einstein has been designed entirely by Tatung in the UK and will be manufactured at the company's Bridgenorth plant Tatung is Taiwan's largest company with a turnover last year of over £500m

New imprint

◄ continued from page 1

tinued "As yet, we have not decided whether to supply houses with the complete system, or whether to manufacture a 'master' package which they can use to package which they can use to protect programs, without actually discovering the method

"There are only four people — the developers themselves — who do know how it works "

A & F's first program with the incorporated imprint will be *Haunted Abbey* for the BBC, available in two to three weeks time It will cost £6 90, as opposed to A & F's usual price of £7 90, in anticipation of increased sales Chuckie Egg for the Commodore 64 should follow shortly afterward, and all A & F's future programs will contain Imprint 2

Low-cost modem from Protek

PROTEK has announced a new low-cost modem for home computers

The device — an acoustic modem — connects to any machine with an RS232 interface and transmits information at a choice of speeds — 1200/1200 or 1200/75 baud

The unit is battery powered and will operate for a 40-hour period on one set of four 1 5 volt batteries

The modem should be available some time in June, priced at £59 55

Details from Protek, 1A Young Square, Brucefield Industrial Park, Livingstone, West Lothian

Advanced filing

MELBOURNE House has announced *Acos+*, an advanced cassette filing system for the Commodore 64

It sets up an on-screen directory at the start of any cassette showing on screen the programs on the tape

Using the system the name of any program Saved to tape is automatically recorded in the directory at the start of the cassette

The list of programs on the tape can then be viewed when the cassette is loaded and a

One missing satellite

UOSAT 2 the satellite built and launched by engineers at Surrey University, appears to have gone missing

The satellite went into space on March 1, made three orbits and then stopped transmitting

The Surrey University group do not know what has happened to the satellite, but believe it is still orbiting the earth at the correct altitude

They have asked technicians at Stanford University, California, to blast high power radio waves at the satellite in an effort to galanise possible electrical faults Stanford's transmitter is 1,000 times more powerful than Surrey's own

Prize money up for grabs

A $5000 prize is still up for grabs following international chess master David Levy's latest win

In 1968, David Levy made a bet that no computer would be able to beat him at chess within 10 years In 1978, he extended the time limit, having successfully fought off all challenges and his $5000 still intact

Last week, he played against the Cray MSC computer, reckoned to be one of the most powerful in the world

After a two day match over four games, he won by four games to nil The match, held at Brunel University, was sponsored by GEC/Dragon, along with a two day seminar on Artificial Intelligence organised by Queen Mary College.

David's company, Intelligent Software, designed the forthcoming Enterprise (née Flan, Elan, etc), computers

11th microfair at Ally Pally

THE 11th ZX Microfair takes place at Alexandra Palace on Saturday April 28th

The Alexandra Pavilion will be open for the show from 10am to 6pm and entry will cost £1 and 50p

Letters

No licence required

Re *Popular Computing Weekly* 12-18 April 1984 News Desk I was most interested to read the snippet on tv licence case dismissed'

I purchased a Commodore 64 in mid October, 1983 My tv is black and white and I hold a monochrome licence However I needed a dedicated colour tv for the computer, so I purchased a 14" colour tv at the same time As expected, the shop notified the tv licence Records Office of the purchase and I received a month later a notice requiring me to obtain a colour licence

I wrote to the Records Office emphasising my job in a legal department and explaining the purpose of the colour tv I went to great lengths to set out the relevant provisions of the Wireless Telegraphy Act 1949 ss 1(1) and 19(1) and stating my opinion that, providing the tv was not used to receive broadcasts a licence was not required

On 28 November, 1983, I received a reply from the Records Office stating

In view of the circumstances you describe, it will not be necessary for you to obtain a television licence I have amended our records accordingly

The report of Peter Battle's case is undated, but I wonder if my correspondence with the Record Office preceded it? If so, why did the Records Office prosecute Peter Battle at all?

JE Lawrence
Manchester

Cracked Hobbit

Hooray, Hooray, I've done it What a relief I actually cracked *The Hobbit* After two months toil I obtained 77 5%

I couldn't have done it without the fantastic help I received from Melbourne House I can't praise them enough

All I can say to them is thanks a lot and if anyone is as slow as I am, then they should get Melbourne House's new book *A Guide to Playing The Hobbit* At £3 95 it's well worth it Even for those who have cracked it, it's worth getting It just shows what a challenge *The Hobbit* can be

Well done Melbourne House Roll on your next two adventures

John Westmacott
18 Wakefield Close
Ronkswood
Worcester WR5 1QR

For those of you interested in solving *The Hobbit* we have a competition on page 43.

More Vic 20 please

Is it possible for you to publish a series of utility programs for the 16K Vic 20 (or unexpanded)? There are many utilities that the machine could do with — for example, renumber, a machine-code monitor, and assembler disassembler, trace etc. I am sure a great many Vic 20 owners would be very grateful if such a series was organised

After all, we don't all want to spend our time shooting down aliens, do we?

Stuart Lowbridge
84 Hall Lane
Walsall Wood
Walsall

Writers write

May I ask you if you would draw the attention of your readers to the meeting to be held at 1 o'clock in the afternoon on Saturday, May 5, at the Kenneth Moore Theatre, Oakfield Road, Ilford to discuss the formation of proposed Society of Software Authors

The idea of this Society was put forward by the Computer Trades Association in their Annual General Meeting last year, when it was agreed that there was a need for a body to represent the interests of Software Authors Although it is hoped that the new Society will affiliate to the Computer Trades Association, it is intended that it will be an independent Society

Anybody who is interested in the writing of software for publication would be well advised to attend the meeting on May 5 If they wish to vote at the meeting they will have to pay an initial subscription of £10 to cover the costs of setting things up, but if they just wish to attend they are quite welcome to do so

Should you require further information please contact the Acting Treasurer Miss Dorene Cox, 7 Meadway Court, Whalebone Lane South, Dagenham, Essex. (tel 01-593 8976) or myself (0530 812320)

Nigel Backhurst
General Secretary
Computer Trades Association

Where will it end?

I am writing to you in an attempt to persuade the huge number of computer users in Britain to raise their voices in protest at the proposed censorship of computer games Although I would be the first to complain about the perversity in Artic's *Ship of Doom* once the Mary Whitehouses of this world start censoring computer games where will it end?

Will *The Hobbit* be banned because its graphic description of the fight scenes? Will the RSPCA ban *Psst* for its cruelty to insects? And what of the wanton destruction of alien life forms — surely this must be banned along with all 'shoot 'em up' games?

I strongly urge that the computering public of this nation should stand up and tell the government where it can stick its censorship

James Hickman (15)
27 Fallow Walk
Spring Park
Northampton

An international flavour

Our school computer club is interested in getting contacts in England but of course we couldn't afford to pay for a real advert, as we do not sell anything

Still, you might help us by squeezing the enclosed copy somewhere in your magazine, or mention us somehow thus giving your publication a truly international standard! Thank you for your help

F J Bayard
Section Petamatique
College Pierre Dubois
71 Rue Victor Boissel
53017 Laval
France




Trashman
GSH
Guild of Software Houses

Ye Olde Castle

A new game for the BBC B by Simon Pithers

This is a new and original program called 'Ye Olde Castle'. It has had a bit of it changed into Machine Code using '&ffbc' which is Acorn's non-vectored Oswrch call and is certainly faster than Basic and a little faster than the Vectored Oswrch (&ffee). The machine code was used because the program would be just too slow and not worth playing at all if it were all in Basic. All program instructions are in the program. This game can probably be played on the Electron, although I do not know if the run time would be fast enough. There are gaps in the listing between each procedure, so that each routine is clearly distinct.

Procedures

PROCtitles This is to put up the program title and play a tune

PROCinst This is to put up the program instructions

PROC set-up This is to set up variables, envelopes and screen

PROCset-screen This is to draw the screen picture of a castle etc

PROCass 1 This is to assemble the machine code to draw the aliens' gun for fast movement

PROCass 2 This is to assemble the machine code to wipe out the aliens' gun

PROCpicend This is to rerun or end the program

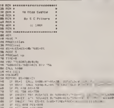
PROCexplode This is to kill you when the energy is gone

PROCkill This is to make guards come out and kill you

PROCend This is to print your score and reincarnate the guard

PROCfire This is to fire your gun





```
10 REM ***************************
20 REM *                         *
30 REM *     Ye Olde Castle      *
40 REM *                         *
50 REM *     By S C Pithers      *
60 REM *                         *
70 REM *        (c 1984          *
80 REM *                         *
90 REM ***************************
100 REM
110 MODE 7
120 PROCtitles
130 PROCinst
[illegible]
150 MODE 5
160 PROCset up
170 TIME=0
[illegible]
200 CALL &[illegible]
[illegible]
220 COLOUR1
230 REPEAT [illegible]
[illegible]
```

```
[illegible]
470 NEXT
480 SOUND 1,2,50,5
[illegible]
510 ENDPROC
520
530
540 DEF PROCASS1[illegible]
[illegible]
590 loop
[illegible]
```

```
840 LDA #175:JSR &FFBC
850 LDA #80:JSR &FFBC
860 RTS
860 ]
870 ENDPROC
880
890
900 DEF PROCASS2(D)
910 P%=&A00
920 [OPT 0
930 LDA #0
940 LDX #80
950 .loop1
960 STA &3C40,X
970 INX:CPX #&40
980 BNE loop1
990 RTS
1000 ]
1010 ENDPROC
1020
1030
1040 DEF PROCEND
1050 FOR I%=200 TO 1 STEP -8
1060   SOUND 1,-10,X%,1
1070   SOUND 2,1,X%,1
1080   SOUND 3,2,X%,1
1090   SOUND 0,0,0,0
1100   NEXT
1110 IF TIME>5=10000 TIME:SC=SC+S:PRINTTAB(1,5);"Score
     ";SC;SL=SL+1:?&85=SL:X%=200:A%=640:Y%=RET:GOTO170
1120 *FX 15,0
1130 ENDPROC
1140
1150
1160 *FX 11,0
1170 VDU 19,0,0;0;:GCOL 0,0
1180 FOR X%=1 TO 512 STEP 4
1190   MOVE 0,X%:DRAW 1280,X%
1200   MOVE 0,1024-X%:DRAW 1280,1024-X%
1210   NEXT
1220 CLS
1230 PROCPICEND
1240
1250
1260 DEF PROCKILL
1270 FOR X%=1 TO 4:COLOUR3
1280   PRINT TAB(X%,20);CHR$225
1290   PRINT TAB(X%-1,20);" ";
1300   PRINT TAB(19-X%,20);CHR$224
1310   PRINT TAB(20-X%,20);" ";
1320   FORG=1 TO 200:NEXT
1330   SOUND 1,-15,X%*10,2
1340   NEXT
1350 FOR X%=1 TO 10
1360   SOUND 1,3,X%,2
1370   NEXT
1380 FOR G=1 TO 500:NEXT
1390 FOR X%=1 TO 30
1400   PROCASS(X%):CALL &A00
1410   NEXT
1420 SOUND 3,3,100,200
1430 GOTO 1160
1440 ENDPROC
1450
1460
1470 DEF PROCset screen
1480 VDU 19,1,3;0;
1490 VDU 19,2,4;0;
1500 VDU 19,5,3;0;
1510 VDU 19,4,6;0;
1520 GCOL 0,1
1530 MOVE 1200,0:MOVE 1200,250:PLOT 85,640,0
1540 MOVE 640,500:PLOT 85,1200,250:MOVE 0,0
1550 MOVE 0,250:PLOT 85,640,0:MOVE 640,500:PLOT 85,0,250
1560 GCOL 0,2
1570 MOVE 500,250:MOVE 810,250:PLOT 85,810,700
1580 MOVE 500,700:PLOT 85,500,700
1590 FOR X%=500 TO 700 STEP 70
1600   MOVE X%,700:MOVE X%,725:PLOT 85,X%+35,725
1610   MOVE X%+35,700:PLOT 85,X%,700
1620   NEXT
1630 GCOL0,3
1640 MOVE 610,250:MOVE 710,250:PLOT 85,500,0
1650 MOVE 0,0:PLOT 85,610,200
1660 MOVE 710,250:PLOT 85,1000,0
1670 MOVE 700,0:PLOT 85,610,250
1680 MOVE 610,250:MOVE 710,250:PLOT 85,710,300
1690 MOVE 610,400:PLOT 85,610,250
1700 MOVE 640,500:MOVE 640,400:MOVE 640,400
1710 FOR I%=1 TO 180 STEP 8
1720   B=PI*I%/180:MOVE 640,400
1730   PLOT 85,50*COS(B)+600,50*SIN(B)+400
1740   NEXT
1750 MOVE 1100,740:MOVE 1100,840
1760 FOR Z%=1 TO 365 STEP 8
1770   B=PI*Z%/180
1780   MOVE 1100,440
1790   PLOT 85,70*COS(B)+1100,70*SIN(B)+940
1800   NEXT
1810 GCOL 0,3
1820 MOVE 500,310:MOVE 610,310:PLOT 85,500,500
1830 MOVE 600,330
1840 PLOT 85,600,310
1850 GCOL 0,2
1860 MOVE 610,200:DRAW 710,700
1870 VDU 23,224,24,60,24,240,24,56,72,136
1880 VDU 23,225,24,60,24,31,24,28,18,17
1890 ENDPROC
1900
1910
1920 DEF PROCset up
1930 PROCset screen
1940 PROCASS1(21)
1950 PROCASS2(30)
1960 ENVELOPE 1,1,0,2,4,10,20,20,100,10,0,0
1970 ENVELOPE 2,1,0,2,0,10,20,20,10,0,10,100,0,0
1980 ENVELOPE 3,1,1,2,3,4,5,6,100,10,0,10
1990 A%=640:Y%=740:B%=640:SL=4:Y%=C%=3:SC=0
2000 ENDPROC
2010
2020
2030 DEF PROCexplode
2040 PRINT TAB(10,5);"Energy Gone"
2050 *FX 9,1
2060 *FX 10,1
2070 *FX 15,0
2080 VDU 19,0,14;0;
2090 FOR X%=255 TO 1 STEP -5
2100   GCOL 3,RND(3)
2110   SOUND 1,2,X%,3
2120   SOUND 2,2,X%,1
2130   SOUND 3,2,X%,3
2140   MOVE 1100,990
2150   DRAW 300(RND(500)+640,100+RND(75))
2160   PROCASS(RND(255)):CALL&A00
2170   NEXT
2180 GOTO 1160
2190 ENDPROC
2200
2210
2220 DEF PROCPICEND
2230 VDU4:CLS
2240 MOVE 20,20:DRAW 1260,20
2250 DRAW 1260,1004:DRAW 20,1004:DRAW 20,20
2260 COLOUR 3
2270 *FX 15,1
2280 PRINT TAB(4);"Score= ";SC
2290 PRINT TAB(4,5);"End of Game
2300 PRINT TAB(4,7);"Press R to
2310 PRINT TAB(4,9);"rerun or any
2320 PRINT TAB(4,11);"other key to
2330 PRINT TAB(4,13);"  END
2340 INPUT TAB(4,15) A$
2350 IF A$="R" THEN CLEAR:RUN
2360 CLS
2370 PRINT "      BYE
2380 END
2390 ENDPROC
2400
2410
2420 DEF PROCinst
2430 CLS
2440 PRINT TAB(12,1);CHR$141+CHR$134+"Castle
2450 PRINT TAB(12,2);CHR$141+CHR$134+"Castle
2460 PRINT
2470 PRINT "This game is set in ye olden days
2480 PRINT "when dragon slayers slayed dragons
2490 PRINT "and helpless young maidens got in
2500 PRINT "distress
2510 PRINT
2520 PRINT "As I am you guessed you are a [illegible]
2530 PRINT "alien who lands at the guarded
2540 PRINT "castle and you have to hit its guard
2550 PRINT "  times to get the damsel [illegible]
2560 PRINT "But the guard is reincarnated
2570 PRINT "and you have to kill again"
2580 PRINT
2590 PRINT "Your Controls are:"
2600 PRINT "Z=left  X=right  RETURN to fire
2610 PRINT
2620 PRINT "So good luck and may god have mercy on
2630 PRINT "your soul
2640 PRINT
2650 PRINT TAB(7);CHR$137 CHR$129"PRESS A KEY"[illegible]
2660 A=GET
2670 CLS
2680 PRINT TAB(13,7);CHR$141+CHR$134+"Castle
2690 PRINT TAB(13,8);CHR$141+CHR$134+"Castle
2700 INPUT TAB(3,13)"Enter a level 1-4 "A%
2710 IF A%<1 OR A%>4 THEN 2670
2720 ENDPROC
2730
2740
2750 DEF PROCtitles
2760 ENVELOPE 5,1,0,0,0,0,0,0,100,10,0,10,126,100
2770 PRINT
2780 PRINT TAB(13,7);CHR$141+CHR$134+"Castle
2790 PRINT TAB(13,8);CHR$141+CHR$134+"Castle
2800 PRINT
2810 REPEAT
2820   READ A,B,C,D
2830   IF A=999 THEN 2860
2840   SOUND 1,A,B,D/1.5
2850   SOUND 2,A,C,D/1.5
2860   UNTIL A=999
2870 SOUND 1,0,0,0:SOUND 2,0,0,0
2880 PRINTTAB(8,18);CHR$157+CHR$129+"PRESS A KEY "+CHR$156
2890 A=GET
2900 ENDPROC
2910
2920
2930 DATA 129,6,149,6,137,6,149,6
2940 DATA 145,7,157,7,153,8,141,5
2950 DATA 149,7,157,7,137,5,149,5
2960 DATA 145,7,157,7,137,5,149,5
2970 DATA 145,25,157,30
2980 DATA 165,7,149,7,149,5,133,5
2990 DATA 149,25,137,25,157,7,145,7
3000 DATA 121,8,137,5,129,30,145,30
3010 DATA 999,999,999,999
```

The games baron

***Graham Taylor** talks to Francis Baron, managing director of W H Smith's cable services division*

If W H Smiths has its way in the next few years, the idea of renting a computer will be no more unusual than that of renting a television. Not only that, but you won't buy games any more — you'll simply download them, choosing your favourite from a menu.

The modus operandi for these changes is the introduction of a cable network specifically for games. Initially they will be available through most of the 11 new cable franchises due to begin operations in early 1985 (See *Popular Computing Weekly* 12-18 April for the full list).

The man behind the operation is Francis Baron who stresses that the possibilities of the system do not end with *Space Invaders*. "We're looking at something for the whole family, although obviously the initial demand is likely to come from games players. In fact, people will be able to word process, do accounts, do their shopping and eventually interact with other players on other machines to play complex games.

The computing technology for the system has been available for a while, but the existing cable networks proved unsuitable. Licences on the old systems only last two years. Any cable operator who takes our system will be supplied with some expensive hardware — obviously we're looking for more than two years of commitment."

The other problems with the old systems are technical. "Most of the existing systems use the HF standard, but for the kind of things we have in mind we use a VHS/VHF delivery system. In addition, most of the old systems only have four channel capacity — obviously they're all going to be used up."

The hardware the subscriber receives is an impressive looking computer called The Window. At its heart is a 6502 with sophisticated sound and graphic chips. First reports suggested maximum K would be 64, but Francis felt this situation might change. "I think we're looking at a choice of two models, 64K or 128K, the latter being, obviously, slightly more expensive to hire."

I suggested that the technical comparison might be with a Commodore 64. "Well, I think it's a little more than that. If it has to be compared with an existing machine, I'd opt for an Apple IIe."

In any event, comparisons are going to be misleading because of the speed with which the system can be loaded. "64K is only going to take a couple of seconds. It'll be better than almost any disc drive. This means that extremely elaborate games can be devised with terrific graphics — adventures, for example, where the next section is loaded once you've reached a certain point."

Superficially, one problem with renting the computer would seem to be the incredible rate of technical obsolescence in the computer industry — how impressive will The Window's specifications look in two or more years time?

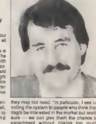
"There are basically two answers to that. Firstly, we already have in mind various enhancements that we could make to the existing machines. Secondly, if The Window starts to get too far behind, we could consider replacing it."

The name of the game though, is software. "Really software is the be all and end all of our service — it's being proved more and more that it's the quality of the software that really matters."

Smith's, in conjunction with associates in America and Canada, have licensing arrangements with most of the major software houses in America. They have even been to Europe. "There will be some very unusual education programs from France for example."

As yet, no British software houses have been signed. "We haven't got around to Britain yet, but obviously there are a number of companies we have in mind — it might prove to be a good way for software houses in this country to test out the market for their games worldwide."

Initially, Francis sees the market for the network being people who are wary of risking much money on buying something



they may not need. "In particular, I see us selling the system to people who think they might be interested in the market but aren't sure — we can give them the chance to experiment without risking too much money."

Francis sees it as important that the network has a wide range. "We're after the whole family. Subscribers will be receiving a monthly magazine letting them know what's going to become available with tips on the games and other features."

In fact, the title The Games Network may prove to be somewhat misleading. Games currently account for only a quarter of the scheduled time.

"We envisage a large number of both educational and tutorial programs being available, not just for children at school but to learn a foreign language, craft or skill."

The big unanswered question is, of course, how much the system is going to cost. Previous reports had suggested a figure of about £10 per month, including the machine and unlimited downloading of software. "I think pricing is still a little uncertain. In some ways it's fairest from every point of view to simply get people to pay for whatever they download, with some programs being more expensive than others. The big problem with that is the extra cost of accounting for it all."

Whatever is finally decided, it looks like the system will be relatively cheap and for games addicts it will solve one massive problem — most games have a life of not more than two months, as the game is mastered, so enthusiasm wanes and the program is not loaded any more.

The analogy, if you like, is with renting videos of films — many people hire videos of films they would not otherwise see, because they are cheap and available.

If the faith evidenced by the amount of money W H Smith is putting into the operation is justified, the repercussions on the industry could be enormous. To what extent will people still want to actually buy games?


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All versions of 'The Hobbit' are identical with regard to the adventure program. Due to memory limitations BBC cassette version does not include graphics.

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Problems from space

Barbara Conway *risks life and limb in a selection of BBC games*

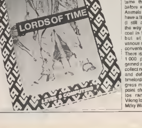
There comes a time in all our lives when we have to face up to the truth however harsh it may appear For me that moment came only a few weeks ago, and it was a bitter pill to swallow After all, when you re 350 or so miles up in space at the controls of one of the most awesome technological advances yet, it s pretty tough to come to terms with the fact that as a space pilot you are a one-woman demolition squad Honestly, if they had the likes of me up there on the space shuttle they d probably end up having to cope with some really daft disasters Like losing two multi-million pound satellites for example

It isn't for want of trying either Of the group of games I was trying out this time for the BBC, three of them were pointing out towards space and two involved the flight skills I yearned to acquire Thus, after being accustomed to read reviews of such software by the usual venturers who are both competent and happy to boldly go into the vastness above you now have the opportunity of learning from the experiences of a klutz with two left hands and a trail of mega expensive wreckage in her wake

To start however, on a note rather less damaging to my ego I was able to put up a considerably better showing with the latest offering in the adventure game line by the fiends at Level 9 Computing who have specialised in sagas designed to overheat the brain such as *Snowball* (*PCW* 15 Feb) The new adventure is *Lords of Time* and it does nothing to detract from Level 9 s reputation as a provider of weeks of brainwork per game Games from this source rarely cheat so you can be sure that, if you can figure it out, there is a way out of every situation

Nobody could accuse Sue Gazzard, who designed this saga (a sequel to which is already well advanced) of making life easy for the adventurer From a sitting start reasonably enough at your own micro, the story takes the adventurer through nine increasingly bizarre worlds, in most of which even the wary and experienced traveller will probably get killed at least once The journey quickly becomes an obsession even when you are in the "real world" It was when poring through a grimly serious financial report in my office for example that the solution to the sabre toothed tiger problem suddenly struck me (making a pleasant change since the tiger itself had struck me, with fatal effect, several times during the previous evening s adventuring)

The zones must be taken in the proper order since that is the only way to collect the wherewithal to solve the problems and the accompanying booklet provides some useful, if well-wrapped up clues Don't be fooled by the fact that the first zone seems extremely tame this is the lull before eight storms Animals tend to behave a little unusually (I still can t believe the way I got the fur coat in the Ice Age) but at least the various species have conventional tastes There is an optimum 1 000 points to be gained in the quest to collect nine treasures and defeat the evil timelords with progress marked in 25-point steps Scenarios range from a Viking longship to the Milky Way ending up with paradise Treasures should be deposited in the clock (if you can t work out how to get into and out of the clock you won t survive long anyway) and the sands of time are running out



At the time of writing I still haven't finished my quest, although I have worked my way through most of the zones and sampled the others The variety of problems including several monsters is extraordinary and requires the adventurer to draw on skills ranging from that of the agent provocateur (if faced with two menaces see if you can get them to fight each other) through animal dentistry, electronic expertise and some good old fashioned magic "*Lords*" also encourages some of the finer feelings Generosity such as helping to clothe the needy can bring its own reward

This adventure is full of surprises including meeting one adversary more familiar to *Dr Who* addicts which seems only fair since you are dealing with timelords Make sure that you remember the key poem given in the documentation don t let the timelords see you and resist impulses to be gratuitously nasty (if you throw that rotten apple you ll regret it) and this should keep any adventure addict satisfied

On to the rather more familiar world of Mr Micro s *Humphrey* a close relation of sundry small beings on various micros who have to negotiate piles of cubes without falling foul of deadly obstacles In this case bombs *Humphrey* can be guided by either joystick or keyboard through different screens each with increasing danger factors, and you can select the start screen There are nine different arenas for *Humphrey* to bounce around on changing the colour of each block as he lands on it ranging from a straightforward pyramid at the start to more convoluted arrangements At first the bombs just thud downwards haphazardly, but as you progress they get sneakier, bouncing up on *Humphrey* when you are not looking Each screen is completed when *Humphrey* has visited each block

The program has clear aracade-style colour graphics and plenty of ear-splitting sound effects *Humphrey* has three lives per game and getting him round all the

cubes becomes an increasingly frantic operation Not exactly a sparkling new idea, but more absorbing than many others

Missile Control from Gemini, is even harder on the eardrums and gives a dazzling screen display as you attempt to clear the skies of enemy bombs with your own three missile bases The instructions are contained in the first part of the program and even after reading them carefully the first try at the real thing left me with a score of exactly nil I think it was at this stage of the review procedure that I started to realise that maybe dealing with problems from space was not my forte

Pulling myself together, however, I improved my total to nearly 5 000 as jets and more obscure enemy craft whirled overhead and the screen filled with the wake of thwarted bombs After each wave the screen works out a bonus for you (it becomes increasingly hard to get) and from the sixth wave the bombs start to think for themselves I wasn t much good at this game, but I enjoyed trying and the graphics are rewarding even when, once again, this incompetent missile controller had lost all her bases and left earth to the mercy of the alien (I think they were alien) nasties

It was with mixed feelings that after failing to distinguish myself with the Gemini package that I loaded Compusoft's *Space Mission Simulator* into my machine My misgivings were justified, but this is in no way a reflection on a program which, for one of the cheapest prices going, gives an enjoyable three-part game

All instructions are on screen, with virtually no packaging given to the cassette itself Task one is to get to your spacecraft and this proved to be so simple that even I managed it The space mission is carried out by keyboard with no joystick option and the pilot zips across the screen simply by alternate pressing of the "N" and "M" keys

Stage two gives a screen representaion of the spacecraft dashbord You have, in appropriate sequence, to arm the lasers, refuel switch on the engines, disengage the brakes etc, all via the appropriate keys so it helps if you have noted them on the crib sheet When all is successfully accomplished you have lift-off

The scene now changes to a "penetrator' -type scenario where you see the ship in what seems to me, as an admitted non-expert in space warfare, a launching route which guarantees that fighters scrambling to get into space and engage invaders will suffer maximum time-consuming difficulty I crashed my ship several times negotiating the launch tunnel before managing to emerge into open space and I haven't managed to nobble the invading craft yet.

At the end of each session you are given a score out of 500, together with a comment on your performance The top score I received was 166 and the usual comment was "Disgraceful" But, even through my chagrin, I have to admit that for the money this offers better-than-average value

Under the circumstances, I think it was very brave of me to attempt Microdeal s *Space Shuttle* a program which has already received plaudits for its original implementation on the Dragon "So you think you can control the most complex piece of flying machinery?" asks the blurb on the program package Well I didn t, so the outcome is not really that much of a disappointment to me On the other hand, the program itself is no kind of disappointment at all quite the contrary

While waiting for the program to load I read the daunting but invaluable 14-page documentation accompanying it Like *Space Mission Simulator* this is a multi-part affair but there any similarity stops dead Every stage of *Space Shuttle* is a major challenge and if it turns out that real prospective shuttle pilots are given this as an aptitude test I wouldn t be at all surprised

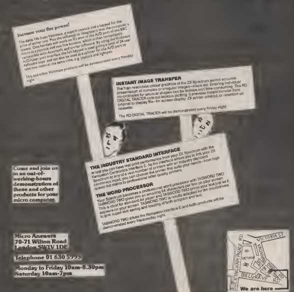
As the program starts you are obviously at the control panel of the shuttle with a distinctly mountainous view through the window above the panel This is launch stage and, while even the likes of me should be able to achieve lift-off there are some crucial manoeuvres which must be achieved (via joystick or keyboard control) to get the shuttle into the proper orbit. As you lift off the mountain view descends and you must keep a keen eye on the control-board gauges and the 'plotboard' which shows your course The shuttle s boosters are pre-set to shut off at orbit velocity and by that time you should be in the box shown on the board

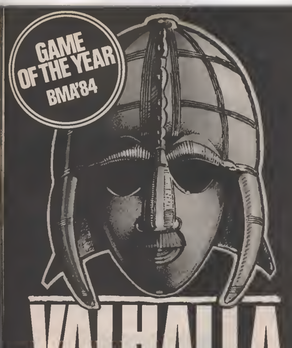
That is the way you are supposed to reach the "park" stage If you foul up the launch navigation then you get to parking position by default You are free to guess how I got there Parking is a very intricate affair requiring a mixture of keyboard and joystick input and fast reactions The view from the window is of the satellite and you have to get it virtually into the centre of the window to complete the manoeuvre After that comes the "arm" stage which unlike most games, does not imply that you are about to zap the satellite In fact you are there to secure it and bring it back for repairs so you must use a robot arm to lock into the satellite and bring it into your shuttle bay You can see the movement of the arm and the opening and closing of the bay doors as (maybe) you bring the satellite in within the 100-second time limit

Then comes re-entry into Earth s atmosphere no engines this time you re gliding followed by the landing stage This is a lot richer than launch and the odds on splattering your craft across the desert are pretty good *Space Shuttle* has clear black and white graphics, realistic accompanying sound and a dangerously addictive quality overall This is a real test of skill and at the end points are awarded out of a total 600 If you think I m telling how much I got think again Dammit I have my pride

Supplier	Program	Cost
Level 9 Computing 229 Hughenden Road High Wycombe Bucks HP13 5PG	*Lords of Time*	£9 90
Mr Micro PO Box 24 Swinton Manchester M27 3AI	*Humphrey*	£6 90
Gemini 18A Littleham Road Exmouth Devon	*Missile Control*	£9 95
Compusoft 32 Watchyard Lane Formby Liverpool L37 3JU	*Space Mission Simulator*	£4 99
Microdeal 41 Truro Road St. Austell Cornwall	*Space Shuttle*	£8 00

MICRO ANSWERS Demonstrations





SOON FOR COMMODORE 64

Dumping ground

***Alan Turnbull** demonstrates how to get a machine code screen dump on the Seikosha GP-250X printer*

This article introduces a machine code routine to be used on the Sinclair ZX Spectrum with ZX Interface 1, RS 232 lead and Seikosha GP-250X Programmable Graphic Printer attached. This will produce a hard copy of the high-resolution screen.

Figure 1 shows a simple Basic program which will do the job, but this is horrendously slow. The equivalent routine translated into Z80 machine code is a big improvement and is shown in Figure 2.

The machine code routine uses the hook codes available in the ZX Interface 1 system to send bytes of data directly across the RS 232 link. The instructions

```
RST 8
DEFB #1E
```

send the byte held in the accumulator to the RS 232 device and so to use the routine, only the following Basic commands are neccessary

```
FORMAT "b" 2400
RANDOMIZE USR 23296
```

Several 16K ROM calls are made and they are as follows

Line 380 CALL #22CE evaluates the POINT function with the x co-ordinate in the C register and the y co-ordinate in the B register and places the result on the calculator stack.

Line 400 CALL #2D28 places the contents of the accumulator on the calculator stack.

Line 410 RST 40 invokes the floating point calculator

Line 420 DEFB 4 causes the top two items on the calculator stack to be multiplied together

Line 430 DEFB 56 causes the floating point calculator to stop operating

Line 440 CALL #2DD5 gets the last value on the calculator stack and compresses it into the accumulator

The routine was assembled on the excellent and professional Z80 GENS3M Assembler by Hisoft and may be relocated anywhere in Ram as long as one remembers to alter the variable pointer in line 40

Figure 3 shows an example output generated by the routine which takes only a few minutes to produce unlike its Basic equivalent.

I hope readers will find the routine useful and perhaps adapt it for other models of printers

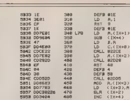
Figure 1

```
  5 FORMAT "b",2400
 10 OPEN #3,"b"
 20 LPRINT CHR$ 27;"L",CHR$ 2,CHR$ 10,
 30 FOR y=175 TO 7 STEP -8
 40 FOR x=0 TO 255
 50 LPRINT CHR$ 27,"G",CHR$ 8,CHR$ 1,
 60 LET p=1  LET b=0  LET l=0
 70 LET b=b+p*POINT (x,y-l)
 80 LET p=p*2  LET l=l+1
 90 IF p<=128 THEN  GO TO 70
100 LPRINT CHR$ b,
110 NEXT x
120 LPRINT CHR$ 10
130 NEXT y
140 LPRINT CHR$ 27,'L";CHR$ 3,
150 CLOSE #3
```

Figure 2

```
Pass 1 errors: 00

                 10 * Seikosha GP-250X Hi-res screen copy for ZX Spectrum
                 20 * (c) Copyright 1984 Alan Turnbull
5B00             30        ORG  23296        ; in printer buffer
5B00 DD215B5B    40        LD   IX,VARS      , point to variables
5B04 3E1B        50        LD   A,27         ,
5B06 CF          60        RST  8            ,
5B07 1E          70        DEFB #1E          ,
5B08 3E4C        80        LD   A,"L"        ,
5B0A CF          90        RST  8            ,
5B0B 1E         100        DEFB #1E          , set up line feed
5B0C 3E02       110        LD   A,2          ,
5B0E CF         120        RST  8            ,
5B0F 1E         130        DEFB #1E          ,
5B10 3E0A       140        LD   A,10         ,
5B12 CF         150        RST  8            ,
5B13 1E         160        DEFB #1E          ,
5B14 DD3601AF   170        LD   (IX+1),175   , y =175
5B18 DD360000   180 NEXTY  LD   (IX+0),0     , x =0
5B1C DD360201   190 NEXTX  LD   (IX+2),1     , p =1
5B20 DD360300   200        LD   (IX+3),0     , b =0
5B24 DD360400   210        LD   (IX+4),0     , l =0
5B28 3E1B       220        LD   A,27         ,
5B2A CF         230        RST  8            ,
5B2B 1E         240        DEFB #1E          ,
5B2C 3E47       250        LD   A,"G"        ,
5B2E CF         260        RST  8            ,
5B2F 1E         270        DEFB #1E          ,
5B30 3E00       280        LD   A,0          ;
5B32 CF         290        RST  8            , set up graphic mode
```



```
5B33 1E              DEFB #1E      ,
5B34 3E01            LD   A,1      ,
5B35 CF              RST  8        ,
5B37 1E              DEFB #1E      ,
5B38 DD7E01     L70  LD   A,(IX+1) ,
5B3B DD9604          SUB  (IX+4)   ,
5B3E 47              LD   B,A      ,
5B3F DD4E00          LD   C,(IX+0) , co-ords x,y-1
5B42 CDCE22          CALL #22CE    , result of POINT(x,y-1) on stack
5B45 DD7E02          LD   A,(IX+2) ,
5B48 CD282D          CALL #2D28    ; put p on stack
5B4B EF              RST  40       ,
5B4C 04              DEFB 4        ,
5B4D 38              DEFB 58       , p*POINT(x,y-1) on stack
5B4E CDD52D          CALL #2DD5    , collect result
5B51 DD8603          ADD  A,(IX+3) , b+p*POINT(x,y-1)
5B54 DD7703          LD   (IX+3),A , b =b+p*POINT(x,y-1)
5B57 DDCB0226        SLA  (IX+2)   ; p =p*2
5B5B DD3404          INC  (IX+4)   , l =l+1
5B5E DD7E02          LD   A,(IX+2) ,
5B61 FE00            CP   0        ,
5B63 20D3            JR   NZ,L70   , IF p<=128 THEN GOTO 70
5B65 DD7E03          LD   A,(IX+3) ,
5B68 CF              RST  8        ,
5B69 1E              DEFB #1E      , send CHR$ b
5B6A DD3400          INC  (IX+0)   ,
5B6D 20AD            JR   NZ,NEXTX , NEXT x
5B6F 3E0A            LD   A,10     ,
5B71 CF              RST  8        ,
5B72 1E              DEFB #1E      , send CHR$ 10,CHR$ 13
5B73 3E0D            LD   A,13     ,
5B75 CF              RST  8        ,
5B76 1E              DEFB #1E      ,
5B77 DD7E01          LD   A,(IX+1) ,
5B7A D608            SUB  8        ,
5B7C DD7701          LD   (IX+1),A ,
5B7F FEFF            CP   255      ,
5B81 2095            JR   NZ,NEXTY , NEXT y
5B83 3E1B            LD   A,27     ,
5B85 CF              RST  8        ,
5B86 1E              DEFB #1E      ,
5B87 3E4C            LD   A,"L"    ,
5B89 CF              RST  8        , set up normal line feed
5B8A 1E              DEFB #1E      ,
5B8B 3E03            LD   A,3      ,
5B8D CF              RST  8        ,
5B8E 1E              DEFB #1E      ,
5B8F C9              RET
                VARS

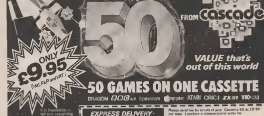
Pass 2 errors  00

L70    5B38    NEXTX  5B1C
NEXTY  5B18    VARS   5B90

Table used     58  from   368
```

Figure 3.





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Conditional responses

***Jason Orbaum and Geoffrey Campbell**, in the fourth part of their series on 6809 assembly language programming, look at the condition code register and branch instructions*

So far we have published the assembler versions of Listings one and two

A lot of you probably saw the command *BNE Loop* and wondered what it did By a process of elimination and with a certain amount of common sense it could have been worked out that this command was replacing the Basic *Goto* that makes the program loop

This mnemonic does, in fact, stand for Branch if Not Equal This construction will be dealt with in more detail later, but for now an explanation of the relative addressing mode

Up to now all addresses have been numbers between 0 and 65535, representing an address in memory In relative addressing however the address is given as a number corresponding to the offset from the address at which the instruction currently being executed is stored This mode is used exclusively for the branch instructions

On the diagram of the processor in Part 2 of this series there is a section labelled CC Register This is the Condition Code Register It is set or reset depending on the value of a byte being computed or transferred and it can be tested and acted upon for instance by the branch instructions

The Condition Code Register is set out so

E F H I N Z V C

where

E, F and I are used in conjunction with interrupts and are of no use at the moment

H is used for Binary Coded Decimal arithmetic and cannot be tested directly,

N is the negative flag and is set when the result of a calculation is less than zero,

Z is the zero flag, and is set when the result of a calculation is zero ie the two numbers under consideration are equal,

V is the overflow flag, and is set when the result of an eight-bit addition is greater than 255,

And C is the carry flag and acts as a ninth bit for some arithmetic operations

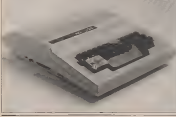
Of these, only the last four are of any real use with the branch instructions, which are

BCC = Branch on Carry Clear	(C=0)
BCS = Branch on Carry Set	(C=1)
BEQ = Branch on Equal To Zero	(Z=1)
BNE = Branch on Not Equal To Zero	(Z=0)
BMI = Branch on Minus	(N=1)
BPL = Branch on Plus	(N=0)
BVC = Branch on Overflow Clear	(V=0)
BVS = Branch on Overflow Set	(V=1)

The other branch instructions test for different combinations of CC Bits These are

BGE = Branch on Greater Than or Equal To
BGT = Branch on Greater Than
BLE = Branch on Less Than or Equal to
BLT = Branch on Less Than

This list may look daunting but it is actually very easy to get used to the branch instructions One way to use them is for comparing numbers If there is a number in the A register then to test it to see if it is less than 10, we could use



```
SUBA #10
BLT BACK
```

where BACK is the location to jump to, say a loop of some kind Unfortunately, this destroys the value in A, so it will have to be stored before testing, and reloaded afterwards, thereby using a memory location as store, and requiring two more machine instructions — hardly ideal code! There is however an instruction that does the whole lot in one go This is the *CMP* (or Compare) instruction

The test routine now becomes

```
CMPA #10
BLT BACK
```

It doesn t look any shorter does it? But it would be in a program, since it cuts out two machine instructions

There are two more branch instructions *BRA* and *BSR*

First, let s look at *BRA* This is used in the same way as the others, but it is slightly different in that it is not conditional — the initials stand for Branch Always, and it does just that

The *BSR* instruction stands for Branch to Subroutine and is not conditional When it is executed the address of the next instruction is pushed on to the stack, and execution transferred to the subroutine When an *RTS* (Return from Subroutine) command is found the address that was pushed on to the stack before going to the subroutine is pulled from the stack and execution continues from this point It should be noted therefore that the stack should be left in the same condition just before an *RTS* as it was just before the corresponding *BSR* unless the return address is to be purposely changed, in which case execution continues from this new address

The branch instructions only occupy two bytes, in the program, and this means that the address offset can only be between −128 and 127 There is therefore, another set of instructions called the long branches The mnemonics are as for normal branches, but preceded by an L For example, *BRA* becomes *LBRA*. This can now access an offset between −32768 and 32767

There are another two instructions to modify the order in which a program executes *JMP* and *JSR* Both of these use either extended direct or indexed addressing *JMP* jumps to the specified address whereas *JSR* jumps to a subroutine at the specified address They are to be avoided if at all possible so that the code is position independent that is it can be stored at any position in memory

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THE Ω RUN

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RED ALERT

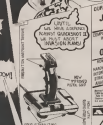
BOOM!

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BOOM!

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TOWN ....

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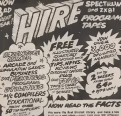
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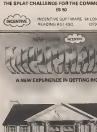
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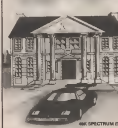
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A character count

***Mark Lawrence** develops a 64 character width word processor for the Spectrum*

This program uses 64print in a word processor allowing text to be entered on a 64 x 24 format. The program offers the following facilities, all accessed by pressing the cap shift key along with the appropriate key:

Capshift + 0 Delete
 " + 1 Clear memory
 " + 2 Capital lock
 " + 3 Move back one page
 " + 4 Move forward one page
 " + 5 Move cursor left
 " + 6 Move cursor down
 " + 7 Move cursor up
 " + 8 Move cursor right

Pressing both shift keys causes the cursor to disappear which indicates extended mode. Extended mode has the following facilities:

Pressing S allows text to be asved to tape. The program will ask for the start page. Enter a letter between A and Y,A being the first page and Y the 25th. You will now be asked for the last page again enter a letter between A and Y, but first start the tape.

Pressing L allows text to be loaded from tape.

Pressing Z allows you to copy the currently displayed screen to the ZX printer.

In addition pressing space will return you to Basic. Enter *Goto* 30 to return. On a 48k Spectrum you can store 25 pages of text, which amounts to 38400 characters or about 9600 words.

Before typing in the machine code, enter the short basic program and *Save* "word" *Line 1*. Having verified this, type in the hex loader and enter the machine code to address 30000 then *Save* "word code" *Code* 30000, 1700. Verify this, then clear the machine and rewind the tape. Type *Load* "" and start the tape. If all is well the program should load and run, then after a short delay a solid cursor should appear in the top left corner of the screen.

If this does not occur, type in the check program, load the code into address 30000 and check it against the listing, poking any incorrect entries.

```
Word Processor Basic

>LIST
  10 CLEAR 23999:LOAD ""CODE 24000
  20 BORDER 6:POKE 23693,40
  30 RANDOMIZE USR 24000
```

```
WORD PROCESSOR CODE

5DC0 21 00 40 22 5F 61 AF 21
5DC8 55 61 77 23 77 21 00 5C
5DD0 77 CD 0E 60 CD 53 5E CD
5DD8 00 5E CD 83 5E 21 00 5C
5DE0 7E FE 0E 28 35 D6 20 DA
5DE8 40 5E FE 60 30 EC 30 00
5DF0 CD 0E 5F CD 83 61 CD 92
5DF8 60 2A 5F 61 CD E3 60 1E
5E00 01 CD E5 5F 3A 55 61 05
5E08 FE 00 20 04 7C C6 07 67
5E10 22 5F 61 CD 63 5E CD 00
5E18 5E 18 0F E5 CD 82 60 E1
5E20 CD 00 5E AF 77 7E FE 00
5E28 20 F0 CD 92 60 C0 AF FE
5E30 05 20 1F FE 53 CC 10 60
5E38 FE 4C CA FC 5F FE 5A 20
5E40 06 F3 00 C6 CD AF 0E CD
5E48 00 5E AF 21 00 5C 77 C3
5E50 DA 5D C9 21 00 58 11 01
5E58 58 01 00 03 3A 00 5C 77
5E60 ED 00 C9 3A 00 61 FE 58
5E68 30 07 21 FF 50 3E 01 18
5E70 08 FE 40 30 0A 21 00 40
5E78 AF 22 5F 61 32 55 61 C9
5E80 F5 E5 0E F0 3A 55 61 FE
5E88 00 20 02 0E 0F 06 00 2A
5E90 5F 61 7E A0 77 24 10 FA
5E98 E1 F1 C9 7E FE 0C 20 27
5EA0 CD 00 5E 2A 5F 61 1E FF
5EA8 CD E5 5F 3A 55 61 FE 01
5EB0 20 05 7D FE FF 20 04 7C
5EB8 D6 07 67 22 5F 61 AF CD
5EC0 03 61 CD E3 60 18 23 FE
5EC8 0D 20 21 CD 00 5E 2A 5F
5ED0 61 7D E6 E0 0F 01 20 00
5ED8 FE E0 20 03 01 20 07 09
5EE0 22 5F 61 CD 63 5E AF 32
5EE8 55 61 18 10 FE 08 20 1A
5EF0 2A 5F 61 7D E6 1F FE 00
5EF8 20 07 3A 55 61 F1 00 28
5F00 10 CD 00 5E 1E [illegible] [illegible] [illegible]
5F08 5F 18 30 FE 09 20 16 [illegible]
5F10 5F 61 7D [illegible] 1F FF 1F 20
5F18 07 3A 55 61 [illegible] 01 26 [illegible]
5F20 CD 00 5E 1E 01 CD [illegible] 5F
5F28 18 [illegible] FE 0A [illegible] [illegible] [illegible] 06
5F30 5E 2A 5F 61 01 20 00 7D
5F38 D0 [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] 09
5F40 2[illegible] 5F F1 [illegible] F1 5F 10 69
5F48 FE 00 20 [illegible] [illegible] [illegible] 5E 2A
5F50 5F 61 01 20 [illegible] 7D DE 20
5F58 00 03 01 [illegible] [illegible] [illegible] ED 42
5F60 22 5F F1 [illegible] 63 5E 10 48
5F68 FE 0F 20 09 31 6A 5C 0A
5F70 EE 0[illegible] 0[illegible] 1A 3F FE 04 28
5F78 16 1A 56 [illegible] FE 00 28 34
5F80 30 3[illegible] 56 61 CD 9E 00 21
5F88 00 40 22 5F 61 18 22 FE
5F90 05 20 0A 3A 56 61 FE 18
5F98 20 1A 3C 10 F4 FE 07 20
5FA0 1A 21 61 64 11 62 64 01
5FA8 00 06 36 00 ED 00 C3 C0
5FB0 50 CD 00 5E CD 92 60 AF
5FB8 32 00 5C C3 DA 5D F5 2A
5FC0 5F 61 7C D6 40 C0 3F CA
5FC8 3F C8 3F 07 29 ED 58 55
5FD0 61 7A 16 00 19 E0 07 07
5FD8 07 04 07 2E 00 19 11 61
5FE0 64 19 F1 77 C9 01 55 61
5FE8 0A 03 E6 01 02 03 FE 00
5FF0 20 01 20 FE 01 20 01 23
5FF8 22 5F 61 F8 F5 D0 21 00
6000 5C 11 07 00 AF 37 CD 58
6008 05 D0 21 61 64 F0 58 00
6010 5C 3E FF 32 CD 56 05 F1
6018 C3 C0 5D F5 06 02 21 26
6020 61 C5 06 15 7E D7 23 10
6028 1B [illegible] 20 E0 C1 7A FE 02
6030 20 04 78 32 57 61 10 E9
```

6038	[illegible]	[illegible]	61	4F	70	91	3C	87
6040	[illegible]	[illegible]	84	67	2E	00	22	60
6048	[illegible]	11	02	00	DD	21	00	9C
6050	[illegible]	[illegible]	1D	C2	04	3A	57	61
6058	[illegible]	[illegible]	[illegible]	04	67	2E	00	01
6060	E1	E4	09	E5	DD	[illegible]	ED	50
6068	[illegible]	[illegible]	3C	[illegible]	32	[illegible]	C2	04
6070	[illegible]	[illegible]	5C	61	[illegible]	[illegible]	60	[illegible]
6078	[illegible]	[illegible]	19	[illegible]	21	00	5C	36
6080	[illegible]	[illegible]	[illegible]	3F	DB	41	30	F9
6088	FE	14	30	[illegible]	FD	92	68	5F
6090	[illegible]	[illegible]	[illegible]	[illegible]	64	00	11	03
6098	00	FD	85	03	F1	C9	92	62
60A0	07	04	6	2E	00	11	01	64
60A8	19	E0	21	00	40	AF	32	5F
60B0	01	01	00	06	E5	D5	C5	E6
60B8	7E	CD	03	61	C1	D1	E1	CD
60C0	E3	60	13	3A	55	61	FE	01
60C8	20	0A	23	7D	FE	00	20	04
60D0	7C	C6	07	67	3A	55	61	3C
60D8	E6	01	32	55	61	00	70	81
60E0	20	D2	C3	C5	D5	E5	11	57
60E8	61	3A	55	61	0E	0F	FE	21
60F0	20	02	0E	F0	06	00	EB	1A
60F8	A1	06	12	23	14	10	F8	E7
6100	D1	C1	C9	E5	11	57	61	6F
6108	26	00	29	29	29	01	61	61
6110	09	06	00	4E	3A	55	61	FE
6118	00	20	00	C8	39	C8	39	C9
6120	39	C8	39	79	12	23	13	10
6128	EA	E1	C9	15	15	00	46	72
6130	6F	60	20	77	60	69	53	60
6138	20	50	61	67	65	20	3F	20
6140	10	15	00	54	6F	20	77	68
6148	69	63	68	20	70	61	67	65
6150	20	3F	20	20	29	00	10	00
6158	00	00	00	00	00	00	00	00
6160	10	00	00	00	00	00	00	00
6168	30	00	40	40	40	40	00	40
6170	00	00	50	A0	00	00	00	00
6178	00	00	00	A0	E0	A0	E0	A0
6180	00	00	40	60	20	40	20	C0
6188	40	00	00	D0	E0	70	60	00
6190	00	00	00	40	A0	40	A0	60
6198	00	00	20	40	80	00	00	20
61A0	00	00	40	A0	00	00	00	40
61A8	00	00	40	20	20	20	20	40
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61C8	00	00	00	00	00	E0	00	00
61D0	00	00	00	00	00	00	00	80
61D8	00	00	20	20	40	40	80	80
61E0	00	00	40	A0	A0	E0	A0	40
61E8	00	00	40	C0	40	40	40	E0
61F0	00	00	40	A0	20	40	80	E0
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6200	00	00	20	60	A0	A0	F0	20
6208	00	00	E0	80	C0	20	A0	40
6210	00	00	60	80	C0	A0	A0	40
6218	00	00	E0	20	20	40	40	40
6220	00	00	40	A0	40	A0	A0	40
6228	00	00	40	A0	A0	60	20	20
6230	00	00	00	40	00	40	00	00
6238	00	00	00	40	00	40	40	80
6240	00	00	00	20	40	80	40	20
6248	00	00	00	00	E0	00	E0	00
6250	00	00	00	E0	[illegible]	[illegible]	40	80
6258	00	00	E0	70	40	[illegible]	00	40
6260	00	00	80	40	E0	E0	00	60
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6270	00	00	C0	A0	C0	A0	A0	C0
6278	00	00	40	A0	80	80	A0	40
6280	00	00	C0	A0	A0	A0	A0	C0
6288	00	00	E0	80	C0	80	80	E0
6290	00	00	E0	80	C0	80	80	80
6298	00	00	40	A0	80	E0	A0	60
62A0	00	00	A0	A0	A0	E0	A0	A0
62A8	00	00	E0	40	40	40	40	E0
62B0	00	00	E0	40	40	40	40	80
62B8	00	00	A0	A0	C0	C0	A0	A0
62C0	00	00	80	80	80	80	80	E0
62C8	00	00	A0	E0	A0	A0	A0	A0
62D0	00	00	A0	A0	E0	A0	A0	A0
62D8	00	00	40	A0	A0	A0	A0	40
62E0	00	00	C0	A0	A0	C0	80	80
62E8	00	00	40	A0	A0	A0	E0	60
62F0	00	00	C0	A0	A0	C0	A0	A0
62F8	00	00	60	80	40	20	20	C0
6300	00	00	E0	40	40	40	40	40
6308	00	00	A0	A0	A0	A0	A0	40
6310	00	00	A0	A0	A0	A0	40	40
6318	00	00	A0	A0	A0	A0	E0	A0
6320	00	00	A0	A0	40	40	A0	A0
6328	00	00	A0	A0	40	40	40	40
6330	00	00	E0	20	40	40	80	E0
6338	00	00	C0	80	80	80	80	C0
6340	00	00	00	80	40	40	20	20
6348	00	00	C0	40	40	40	40	C0
6350	00	00	40	E0	40	40	40	40
6358	00	00	00	00	00	00	00	E0
6360	00	00	60	80	80	C0	80	E0
6368	00	00	00	40	20	60	A0	60
6370	00	00	80	80	80	C0	A0	C0
6378	00	00	00	40	A0	80	A0	40
6380	00	00	20	20	20	60	A0	60
6388	00	00	00	40	A0	E0	80	60
6390	00	00	20	60	40	E0	40	40
6398	00	00	00	60	A0	60	20	C0
63A0	00	00	80	80	C0	A0	A0	A0
63A8	00	00	20	40	00	40	40	40
63B0	00	00	00	20	20	20	A0	40
63B8	00	00	80	A0	A0	C0	A0	A0
63C0	00	00	60	80	80	80	80	60
63C8	00	00	00	60	E0	A0	A0	A0
63D0	00	00	00	40	A0	A0	A0	A0
63D8	00	00	C0	40	A0	A0	A0	40
63E0	00	00	C0	C0	A0	C0	80	80
63E8	00	00	00	60	A0	60	20	30
63F0	20	00	00	60	80	80	80	80
63F8	00	00	00	60	80	40	20	C0
6400	00	00	00	E0	C0	40	40	40
6408	00	00	00	A0	A0	A0	A0	40
6410	00	00	00	A0	A0	A0	40	40
6418	00	00	00	A0	A0	A0	E0	A0
6420	00	00	00	A0	A0	40	A0	A0
6428	00	00	00	A0	A0	60	20	A0
6430	40	00	00	E0	20	40	80	E0
6438	00	00	20	40	C0	40	40	20
6440	00	00	40	40	40	40	40	40
6448	00	00	80	40	20	40	40	80
6450	00	00	50	A0	00	00	00	00
6458	00	00	60	90	F0	D0	F0	60

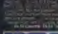
"ADVENTURES INTO IMAGINATION"





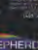
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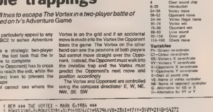
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Visible trappings

***Merk Gornell** tries to escape The Vortex in a two-player battle of strategy, based on tv's* Adventure Game

This game will particularly appeal to any fan of the BBC2 tv series *Adventure Game*

The Vortex is a strategic two-player game based on the last task that the tv adventurers have to complete

One player (The Opponent) has to cross the playing grid to reach the exit, while the other (The Vortex) tries to prevent the Opponent's escape

The Opponent cannot see where the Vortex is on the grid and if an accidental move is made into the Vortex the Opponent loses the game The Vortex on the other hand can see the positions of both players but cannot move straight over the Opponent. Instead, the Opponent must walk into the invisible trap and the Vortex must predict the Opponent's next move and position accordingly

The Vortex and Opponent are controlled using the compass directions· E, W, NE, NW, SE SW

Program notes

2	Define variables
4	Clear sound chip
6–22	Introduction
24–36	Vortex move
38–52	Opponent move
54–64	Vortex illegal move
66–74	Vortex win
76–86	Opponent win
88–90	Lose sound
92–118	Draw grid
118–160	Check move

Variables

P1—Screen co-ordinate
C1—Colour co-ordinate
VX—Vortex's X co-ordinate
VY—Vortex's Y co-ordinate
X—Opponent's X co-ordinate
Y—Opponent's Y co-ordinate
S=Start of sound chip
V$—Name of vortex controller
N$ Name of opponent controller
G Alternative for VX or X
H—Alternative for VY or Y

```
1 REM *** THE VORTEX - MARK 6,1984 ***
2 POKE53280,0:POKE53281,0:P1=1024:C1=55296:VX=23:X=17:Y=3:VY=21:S=54272
4 FORI=STOS+24:POKEI,0:NEXT
6 PRINT"[CLR]":PRINTTAB(13)"[DOWN3][CTRL2]WELCOME TO ARG"
8 PRINT"[CBM7][DOWN2]NOW THAT YOU'VE PAID YOUR DROGNAS,"
10 PRINT"[DOWN1]WHAT IS THE NAME OF THE PLAYER WHO WILL"
12 INPUT"[DOWN1]PLAY ON BEHALF OF THE VORTEX";V$
14 INPUT"[DOWN1]AND YOUR OPPONENTS NAME IS";N$
16 PRINTTAB(7)"[DOWN2][CTRL2]GRONDA GRONDA ";V$;" AND ";N$:FORI=1TO4000:NEXT
18 PRINT"[CLR][CTRL6]OPPONENT: ";N$;"=[CBM7][SFT@][CTRL6]"
19 PRINT"VORTEX: ";V$;"=[CTRL3][SFTQ]"
20 GETA$:IFA$=""THEN20
22 GOTO46
24 GOSUB54:POKEP1+VX+40*VY,81:POKEC1+VX+40,2:POKEP1+X+40*Y,81
26 POKEC1+X+40*Y,14:INPUT"[CTRL6][HOME]WHAT IS THE VORTEX'S MOVE";M$
28 POKEC1+VX+40*VY,1:G=VX:H=VY:GOSUB80:VX=G:VY=H:GOSUB124
30 IFX=VXANDY=VYTHEN 128
32 POKEP1+VX+40*VY,81:POKEC1+VX+40*VY,2:PRINT"[HOME]PRESS A KEY BEFORE ";N$;
34 PRINT"[SPACE10]":PRINT"COMES BACK TO THE SCREEN."
36 GETA$:IFA$=""THEN36
38 GOSUB54:POKEP1+X+40*Y,81:POKEC1+X+40*Y,14:PRINT"[HOME][CTRL6]";N$;
40 INPUT",WHAT IS YOUR MOVE.";M$:POKEC1+X+40*Y,1:G=X:H=Y:GOSUB80:X=G:Y=H
42 GOSUB124:POKEP1+X+40*Y,81:POKEC1+X+40*Y,14:IFX=VXANDY=VYTHEN 136
44 FORI=1TO2000:NEXT:IFY=21THEN146
46 PRINT"[HOME]";N$;"[SPACE30]"
48 PRINT"SHOULD NOW BE AWAY FROM THE SCREEN."
50 GETA$:IFA$=""THEN50
52 GOTO24
54 POKES+5,38:POKES+6,95:POKES+24,15:POKES+1,34:POKES,75:POKES+4,33
56 FORI=1TO150:NEXTI:POKES+1,18:POKES,214:FORI=1TO200:NEXT:POKES+24,0:RETURN
58 GOSUB158:PRINT"[CLR][CTRL6]THAT WAS AN ILLEGAL MOVE,";V$
60 PRINT"[DOWN3]I'M SORRY TO SAY THAT YOU HAVE BEEN[DOWN3][CTRL2]"
61 PRINT"DISQUALIFIED !!"
62 GETA$:IFA$=""THEN132
64 GOTO 146
66 GOSUB158:PRINT"[CLR][CTRL6]";N$;" HAS BEEN EVAPOURATED INTO SPACE.[DOWN2]"
68 PRINTV$;"[CBM6],YOUR SHUTTLE IS NOW LEAVING"
70 PRINT"[DOWN1]FOR EARTH.WELL DONE."
72 GETA$:IFA$=""THEN142
74 RUN
76 FORN=1TO4:POKES+24,15:POKES+1,137:POKES,43:POKES+4,33
78 FORI=0TO137:POKES+1,I:POKES+1,I+8:NEXTI:POKES+24,0:NEXTN
80 PRINT"[CLR][CBM6]WELL DONE ";N$:PRINT"YOU HAVE BEATEN THE VORTEX.[DOWN4]"
82 PRINT"[CTRL6]YOUR SHUTTLE LEAVES FOR EARTH IN 5 MINS."
84 GETA$:IFA$=""THEN154
86 RUN
88 FORI=1TO40:POKE53280,1:POKE53280,0:NEXTI:POKES+24,15:POKES+1,137:POKES,43
90 POKES+4,17:FORI=137TO0STEP-1:POKES+1,I:POKES+1,I+8:NEXTI:POKES+24,0:RETURN
92 PRINT"[CLR][CTRL2][DOWN2]":FORI=1TO4:PRINTTAB(17)"[SFTQ][SFTC*5][SFTQ]"
94 IF I<4THENPRINT"[DOWN4]":NEXTI
```

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```
96 PRINT"[HOME][DOWN3]":FORI=1TO3:PRINTTAB(16)"/ \   / \"
98 IFI<3THENPRINT"[DOWN4]":NEXTI
100 PRINT"[HOME][DOWN4]":FORI=1TO3:PRINTTAB(15)"/   \ /   \"
102 IFI<3THENPRINT"[DOWN4]":NEXTI
104 PRINT"[HOME][DOWN5]":FORI=1TO3:PRINTTAB(14)"[SFTQ][SFTC#5][SFTQ][SFTC#5][SFT#
]"
106 IFI<3THENPRINT"[DOWN4]":NEXTI
108 PRINT"[HOME][DOWN6]":FORI=1TO3:PRINTTAB(15)"\   / \   /"
110 IFI<3THENPRINT"[DOWN4]":NEXTI
112 PRINT"[HOME][DOWN7]":FORI=1TO3:PRINTTAB(16)"\ /   \ /"
114 IFI<3THENPRINT"[DOWN4]":NEXTI
116 PRINTTAB(19)"[DOWN2][RVS]EXIT[RVOFF]":RETURN
118 IFM$="E"THENG=G+6

120 IFM$="W"THENG=G-6
122 IFM$="NE"THENG=G+3:H=H-3
124 IFM$="NW"THENG=G-3:H=H-3
126 IFM$="SE"THENG=G+3:H=H+3
128 IFM$="SW"THENG=G-3:H=H+3
130 IFG<14THENG=14
132 IFG>26THENG=26
134 IFH>21THENH=21
136 IFH<3THENH=3
138 IFH=3ANDG<17THENG=17
140 IFH=3ANDG=20THENG=23
142 IFH=3ANDG>23THENG=23
144 IFH=9ANDG<17THENG=17
146 IFH=9ANDG>23THENG=23
148 IFH=15ANDG<17THENG=17
150 IFH=9ANDG>23THENG=23
152 IFH=15ANDG<17THENG=17
154 IFH=15ANDG>23THENG=23
156 IFH=21ANDG<17THENG=17
158 IFH=21ANDG>23THENG=23
160 RETURN
```

A balancing act

Robert Crook presents a program to balance chemistry equations

This program is written for the BBC Model A or B and occupies some 2K of memory. The program is relatively short and uses the Mode 7 text.

If you are familiar with the idea of chemistry equations, then you will also be used to the idea of balancing them. With short equations this is often very simple but when balancing longer equations the process is often hard, time-consuming and monotonous. This program can solve any balancing problem, no matter how long the equation.

For those of you not familiar with the idea of balancing, here is a brief explanation. When two or more chemicals are mixed together or heated they often react to produce different chemicals. For example, when sulphur is burned in oxygen the resultant gas is sulphur dioxide. This reaction can be expressed in words, ie

Sulphur + oxygen = sulphur dioxide

The same reaction can, however, be expressed more precisely in the form of an equation, ie

$S + O_2 = SO_2$

If you examine this equation you will see that there equal amounts of each element on each side of the equation, eg on the left hand side there is one sulphur atom and two oxygen atoms. On the right hand side there is also one sulphur atom and two oxygen atoms. Therefore, this equation is already balanced. The following is not balanced

$C_4H_{10} + O_2 = CO_2 + H_2O$

If you examine only the oxygen atoms you will see that there are two on the left but three on the right. The equation cannot, therefore, be balanced already. It would take considerable time to work this out without the aid of this program. As it is, the balanced equation is

$2\ C_4H_{10} + 13\ O_2 = 8\ CO_2 + H_2O$

Using the program to solve this, the inputs would have been the following.

Number of reactant chemicals (Those on LHS)	2
Number of product chemicals (Those on RHS)	2
Input the reactant chemicals	C4H10 (Press Return) O2 (Press Return)
Input the product chemicals	H2O H2O

You will now have to wait for the computer to display the balanced equations on the screen.

All the elements used so far have only one letter for their symbol and this must be a capital letter, eg C,S,H etc. A great deal of elements, however, have two letters for their symbol, eg, Na, Pb, Li, etc. When inputing these types of elements you must enter the first letter as a capital and the second as lower case.

Line Number	Comments
90-190	These lines present the balanced equation
200-300	The equation is entered here
310-980	This procedure works out the number of atoms on each side of the equation according to the various elements

It is difficult to explain exactly how the program works. The best way is to take an example and balance it as the computer would. Let the equation be

$H_2S + SO_2 = H_2O$

This is the reaction of hydrogen sulphide with sulphur dioxide to produce sulphur and water.

Firstly, the computer determines the elements present and places their symbols in an array. In this case there are three elements H, O and S. The next step is to find out how many atoms of each element are on each side of the equation. This is best shown in table form.

You can see in 5) that the number of atoms of each element on each side of the equation is equal. The equation is now balanced.

$2\ H_2S + SO_2 = 3\ S + 2\ H_2O$

		LHS			RHS			
Elements present		H	S	O	H	S	O	
No of atoms	1)	2	2	2	2	1	1	Add up the numbers on the LHS=6 (2+2+2) Add up the numbers on the RHS=4 More atoms on LHS therefore add to the RHS. LHS has more S and more O. Try to find a chemical on the RHS with both S and O in. There is not one, so choose one with just S or O in. H2O will do. Place a 2 in front of this and calculate the result.
	2)	2	2	2	4	1	2	H2S+SO2=S+2H2O
								Add up the numbers in 2) for the LHS=6 Add up numbers for the RHS 7. Therefore add to the LHS. RHS has more H. Try to find a chemical on the LHS with H in it. H2S will do. Put a 2 in front of this and get result.
	3)	4	3	2	4	1	2	2H2S+SO2=2H20
								Add up the numbers in 3) for the LHS=9 Add up numbers for the RHS=7 Add to the RHS. LHS has more S. Find chemical on the RHS with S. S will do. Place a 2 in front of this
	4)	4	3	2	4	2	2	2HS+SO2-2S+'HEO
								Add up the numbers in 4) for the LHS=9 Add up the numbers for the RHS=8 Add to the RHS. LHS has more S. Find chemical on the RHS with S. The S will do. There is already a 2 in front so now we must place a 3 there
	5)	4	3	2	4	3	2	2H2S+SO2 3S+2H2O

```
>L.
   10 REM****************************
   20 REM*  Equations Balancer      *
   30 REM*     Robert   Crook       *
   40 REM*      March   1984        *
   50 REM****************************
   60 MODE 7
   70 PROCinput
   80 PROCWorkout
   90 CLS:PRINT TAB(2,5)CHR$(131)"The Equation has been balanced."
  100 PRINT''
  110 FOR A%=1 TO V
  120   IF U(A%)<>1 THEN PRINT CHR$(133)STR$(U(A%));
  130   PRINT CHR$(131)A$(A%);
  140   IF A%<RC OR (A%>RC AND A%<V) THEN PRINT"+";
  150   IF A%=RC THEN PRINT CHR$(130)"=";
  160   NEXT
  170 PRINTTAB(8,15)CHR$(134)'Press any Key "
  180 S=GET:RUN
```

```
190 END
200 DEFPROCInput
210 PRINT'';PRINTCHR$(145);CHR$(157);CHR$(131);CHR$(141)'      Equations Balanc
er ';PRINTCHR$(145);CHR$(157);CHR$(131);CHR$(141)"      Equations Balancer "
220 PRINT''
230 INPUT"  How many reactant chemicals "RC
240 INPUT'  How many product chemicals  "PC
250 V=RC+PC:DIM A$(V)
260 PRINTCHR$(131)" Input the reactant chemicals "
270 FOR A=1 TO RC:INPUT TAB(2);A$(A):A$(A)=A$(A)+' ":NEXT
280 PRINTCHR$(131)  Input the product chemicals
240 FOR B=(1+RC) TO V:INPUT TA$(2);A$(B):A$(B)=A$(B)+  ":NEXT B
300 ENDPROC
310 DEFPROCWorkout
320 DIM B$(20):H=1
330 FOR C%=1 TO V
340   FOR D%=1 TO LEN(A$(C%))
350     E$=(MID$(A$(C%),D%,1)):E=VAL(E$)
360     IF E<>0 OR E$=" " OR E$="0" THEN 430
370     IF ASC(MID$(A$(C%),D%+1,1))>90 THEN E$=MID$(A$(C%),D%,2):D%=D%+1
380     B$(H)=E$:G=0
390     FOR F%=0 TO H-1
400       IF B$(F%)=B$(H) THEN G=1
410       NEXT
420     IF G<>1 THEN H=H+1
430     NEXT
440   NEXT
450 NE=H-1:DIM A(V*NE),T(NE*2),U(V)
460 FOR A%=1 TO V:U(A%)=1:NEXT
470 FOR A%=1 TO V*NE:A(A%)=0:NEXT
480 FOR K%=1 TO NE
490   FOR I%=1 TO V
500     FOR J%=1 TO (LEN(A$(I%))-1)
510       Y$="":E1=0
520       E$=MID$(A$(I%),J%,1):F$=MID$(A$(I%),J%+1,1)
530       E=VAL(MID$(A$(I%),J%+1,1))
540       IF ASC(F$)>90 THEN E=VAL(MID$(A$(I%),J%+2,1)):J%=J%+1:E$=E$+F$
550       E1=VAL(MID$(A$(I%),J%+2,1)):W$=MID$(A$(I%),J%+2,1)
560       IF (W$="0" OR E1<>0) AND E<>0 THEN J%=J%+1:Y$=STR$(E)+STR$(E1):E=VAL
(Y$)
570       IF E=0 THEN E=1
580       IF B$(K%)=E$ THEN A(K%+(NE*(I%-1)))=E*U(I%)+A(K%+(NE*(I%-1)))
590       NEXT:NEXT:NEXT
600 PROCCount(1,RC,0)
610 PROCCount(RC+1,V,NE)
620 IF D=1 THEN 880
630 T=0:T1=0:O=0:I$=" "
640 FOR N%=1 TO NE
650   T=T+T(N%):T1=T1+T(NE+N%)
660   NEXT
670 IF T1>=T THEN 710
680 FOR N%=1 TO NE
690   IF T(N%)>T(N%+NE) THEN I$=I$+B$(N%)
700   NEXT:GOTO 740
710 FOR N%=1 TO NE
720   IF T(N%+NE)>T(N%) THEN I$=I$+B$(N%)
730   NEXT:O=1
740 IF O=1 THEN ST=1:F=RC ELSE ST=RC+1:F=V
750 GT=0:TT=0:R=0
760 FOR N%=ST TO F
270   FOR P%=1 TO LEN I$
780     FOR Q%=1 TO LEN A$(N%)
790       X$=MID$(I$,P%,1):Y$=MID$(I$,P%+1,1)
800       IF ASC(Y$)>90 THEN X$=X$+Y$:P%=P%+1
810       IF MID$(A$(N%),Q%,1)=MID$(I$,P%,1) THEN TT=TT+1
820       NEXT
830     NEXT
840   IF TT>GT THEN GT=TT:R=N%
850   TT=0:NEXT
860 U(R)=U(R)+1
870 GOTO 470
880 ENDPROC
890 DEFPROCCount(START,FINISH,M)
900 LOCAL N:R=NE
910 FOR L%=1 TO NE
920   T=0
930   FOR K%=START-1 TO FINISH-1
940     T=T+A(L%+K%*N)
950     NEXT
960   T(L%+M)=T
970   NEXT
980 D=1:FOR N%=1 TO NE:IF T(N%)<>T(N%+NE) THEN D=0
990   NEXT
1000 ENDPROC
```

Open Forum

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the *Program of the Week* double our new fee of £6 for each program published.

Hangman

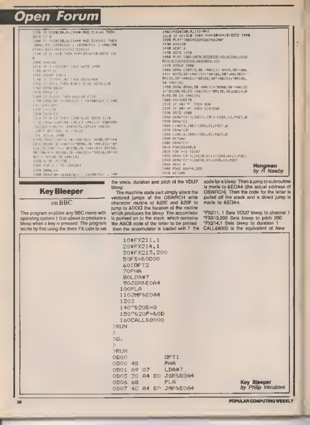
on Dragon 32

The old game of Hangman is for two players. The first enters a word and the second has to guess it. If an incorrect letter is entered the scaffold starts to build culminating with the figure being hanged to a suitable dirge. When the word is guessed, Yankee Doodle is played.

Program notes

110-360	Sets up letters
370-480	Sets up scaffold and man
510-700	Prints title page and plays tune
720-880	Inputs word to be guessed
900-930	Gives audible signal to indicate word cleared from screen
940-1070	Prints screen including number of dashes indicating number of letters in word
1080-1220	Letters are entered & checked to see if they are in the word. Will print them in correct position
1230-1340	Prints part of scaffold if letter not in word
1360-1460	Prints up correct word
1480-1530	Asks if you want another go
1600-1670	Clears the screen

```
10 '[illegible]
20 '****HANGMAN****
30 '[illegible]
40 '*****L.NEWBY*****
50 '***************
60 CLEAR 200
70 PCLS
80 PMODE 3,1:SCREEN1,0
90 DIM C(50)
100 DIM A$(26)
110 A$(1)="U10E5R5F5D7NL15D8"
120 A$(2)="NR10U15R10F3G4NL5F3G3L10"
130 A$(3)="BM+13,-12H3L4G5D5F5R4E3"
140 A$(4)="R5NU15R5E5U5H5L10"
150 A$(5)="NR13U7NR10U8R13"
160 A$(6)="U8NR13U7R13"
170 A$(7)="BM+14,-12H3L5G5D5F5R4E4U4NL4"
180 A$(8)="U8NU7R15NU7D8"
190 A$(9)="R7NR8U15NR8L8"
200 A$(10)="BM+15,-15L5NL10D15L5U5"
210 A$(11)="U8NF8NE8U7"
220 A$(12)="NU15R13"
230 A$(13)="U15F7E7D15"
240 A$(14)="U15F15U15"
250 A$(15)="BM+0,-5U5E5R5F5D5G5L5H5"
260 A$(16)="U15R10F3D2G3L10"
270 A$(17)="BM+0,-5U5E5R5F5D5G5L5H5NF5"
280 A$(18)="U7R4NF8E4U3H3L6D"
290 A$(19)="R10E3U3L10U3E3R5"
300 A$(20)="BM+5,+0U15NL7R8"
310 A$(21)="BM+0,-15D10F5R5E5U10"
320 A$(22)="BM+0,-15D8F8E7U8"
330 A$(23)="NU15E7F7U15"
340 A$(24)="E15BM-15,+0F15"
350 A$(25)="BM+5,-15NU5NH5E5"
360 A$(26)="NR15E15L15"
370 DIM B$(12)
380 B$(1)="BM150,185U20R5ND5U1...
5R5D5R5D5R5D5L17D3L5U5RH10U10..." [partly illegible]
15L5U2RR5"
390 B$(2)="BM180,165;U80R20ND5L3..." [partly illegible]
55C3R1D80
400 B$(3)="BM175,185;L4H5NG5H5"
410 B$(4)="BM105,110,C3R25U10..." [partly illegible]
NL24C3U10 25"
420 B$(5)="BM105,120;C4E5NH5E5"
430 B$(6)="BM102,110,C2D2C4D2C7D7C4U1"
440 B$(7)="BM102,117,C2R3D8G2H2U6R2"
450 B$(8)="BM102,125;C3R4D4L2D4..." [partly illegible]
460 B$(9)="BM108,125;F8G2H4"
470 B$(10)="BM120,125,G8F2E4"
480 B$(11)="BM100,133;C4G10F2E12"
490 B$(12)="BM104,133,C4F10G2H12"
500 GOSUB 1540
510 DRAW"C3S5"
520 C=14:U=100
530 DRAW"BM15,30,"+A$(8)
540 DRAW"BM45,30"+A$(1)
550 DRAW"BM75,30;"+A$(14)
560 DRAW"BM105,30;"+A$(7)
570 DRAW"BM135,30,"+A$(13)
580 DRAW"BM165,30;"+A$(1)
590 DRAW"BM195,30;"+A$(14)
600 LINE(15,35)-(215,35),PSET
610 DRAW"S4C2"
620 LINE(15,36)-(215,36),PSET
630 DRAW"C4"
640 LINE(15,37)-(215,37),PSET
650 FOR X=1 TO12
660 DRAW B$(X)
670 NEXT
680 PLAY"O3T5EFGEDFGEDLDEFDL2C"
690 FOR X=1 TO1000
700 NEXT
710 GOSUB 1600
720 DRAW"C2"
730 DRAW"BM10,40"+A$(5)+"BM30,40,"+A$(1
4)+"BM50,40;"+A$(20)+"BM70,40;"+A$(5)+"B
M50,40;"+A$(18)+"BM130,40,"+A$(23)+"BM15
0,40;"+A$(15)+"BM170,40"+A$(18)+"BM130,
40,"+A$(4)
740 DRAW"S2"
750 DRAW"S4C3"
760 N=10
770 M=100
780 X$=INKEY$
790 IF X$="" THEN 780
800 IF PEEK(338)=191 THEN 890
810 IF ASC(X$)>=65 AND ASC(X$)<=90 THEN
820 ELSE GOTO 780
820 DRAW"BM"+STR$(N)+","+STR$(M)+";"+A$
(ASC(X$)-64)
830 SOUND 150,1
840 N=N+20
850 IF N>230 THEN M=M+20:N=10
860 D$=D$+X$
870 IF LEN(D$)=26 THEN 850
880 GOTO 780
890 GOSUB 1600
900 FORX=1TO50 STEP 10
910 FOR X1=X TO X+10 STEP 1
920 SOUND X1,1
930 NEXT X1,X
940 DRAW"C2"
950 DRAW"BM10,40"+A$(5)+"BM30,40"+A$(14)
+"BM50,40"+A$(20)+"BM70,40"+A$(5)+"BM90,
40"+A$(18)+"BM130,40"+A$(12)+"BM150,40"+
A$(5)+"BM170,40"+A$(20)+"BM190,40"+A$(20
)+"BM210,40"+A$(5)+"BM230,40"+A$(18)
960 LINE(10,105)-(132,140),PSET,B
970 DRAW"C3"
980 PAINT(15,150),4,2
990 LINE(5,100)-(134,135),PSET,B
1000 N=10
1010 M=70
1020 DRAW"C4"
1030 FOR X=1 TO LEN(D$)
1040 LINE(N,M)-(N+15,M),PSET
1050 IF N>210 THEN M=M+25:N=10:GOTO 1070
1060 N=N+20
1070 NEXT
1080 DRAW"C3"
1090 T=0
1100 B=0
1110 X$=INKEY$
1120 IF X$="" OR X$=" " OR X$=CHR$(13) T
HEN 1110
1130 IF ASC(X$)>=65 AND ASC(X$)<=90 THEN
 GOTO1140 ELSE GOTO1110
1140 A=0
1150 N=10:M=65
1160 FOR X=1 TO LEN(D$)
```



Open Forum

```
1 [illegible] IF MID$(D$,X,1)=X$ AND C(X)=1 THEN
GOTO 11[illegible]
1180 IF MID$(D$,X,1)=X$ AND C(X)<>1 THEN
DRAW"BM"+STR$(N)+","+STR$(M)+"[illegible]"+A$[(AS
C(X$) 64)]:A=1:I=T+1:C(X)=1
1190 IF N [illegible] 210 THEN M=M+25:N=10:GOTO 121
0
1200 N=N+20
1210 IF T=LEN(D$) THEN GOTO 1400
1220 NEXT X
1230 SOUND 150,1
1240 IF T [illegible] THEN GOTO1460
1250 IF A<>1 THEN B=B+1 ELSE GOTO1110
1260 DRAW B$(B)
1270 DRAW C3
1280 IF C>122 THEN [illegible]
1290 DRAW"BM"+STR$(L)+","+STR$(U)+"[illegible]"+A$
[illegible]
1300 [illegible]
1310 DRAW C3
1320 IF B=12 THEN 1330 ELSE GOTO 1110
1330 DRAW [illegible]
[illegible]
[illegible]
[illegible] GOSUB 1600
1370 DRAW [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
1370 N=10 [illegible]
1380 FOR X=1 TO LEN(D$)
1390 DRAW C4
1400 DRAW"BM"+STR$(N)+","+STR$(M)+","+A$
(ASC(MID$(D$,X,1))-64)
1410 IF N>=210 THEN M=M+20:N=10:GOTO 1440
1420 PLAY"T8O4CEDFEDEFEECA0"
1430 N=N+20
1440 NEXT X
1450 GOTO 1470
1460 PLAY"[illegible]"
1470 GOSUB 1600
1480 DRAW"C2BM15,50"+A$(1)+"BM45,50"+A$(
14)+"BM75,50"+A$(15)+"BM105,50"+A$(30)+
"BM135,50"+A$(8)+"BM155,50"+A$(5)+"BM195,
50"+A$(18)
1490 DRAW"BM40,50"+A$(2)+"BM80,50"+A$(15
)+"BM150,50,C3"+A$(25)+"BM120,50;C2E;S;B
M140,50C4"+A$(1A)
1500 X$=INKEY$
1510 IF X$="Y" THEN RUN
1520 IF X$="N" THEN CLS:END
1530 GOTO 1500
1540 DRAW"C4":LINE(1,191)-(254,1),PSET,B
1550 DRAW"C2"
1560 LINE(2,190)-(253,2),PSET,B
1570 DRAW"C3"
1580 LINE(4,189)-(251,3),PSET,B
1590 RETURN
1600 DRAW"C1"
1610 POKE65495,0
1620 FOR X=5 TO187
1630 DRAW"C3":LINE(8,X+1)-(248,X+1),PSET
1640 DRAW"C1":LINE(8,X)-(249,X),PSET
1650 NEXT X
1660 POKE 65494,255
1670 RETURN
```

Hangman
by R Newby

Key Bleeper

on BBC

This program enables any BBC micro with operating system 1.0 or above to produce a bleep when a key is pressed. The program works by first using the three FX calls to set the voice, duration and pitch of the VDU7 bleep.

The machine code part simply alters the vectored jumps of the OSWRCH write character routine at &20E and &20F to jump to &D00 the location of the routine which produces the bleep. The accumulator is pushed on to the stack which contains the ASCII code of the letter to be printed then the accumulator is loaded with 7 the code for a bleep. Then a jump to subroutine is made to &E0A4 (the actual address of OSWRCH). Then the code for the letter is pulled off the stack and a direct jump is made to &E0A4.

*FX211, 1 Sets VDU7 bleep to channel 1
*FX213,200 Sets bleep to pitch 200
*FX214,1 Sets bleep to duration 1
CALL&8000 is the equivalent of *New*

```
10*FX211,1
20*FX214,1
30*FX213,200
50FX=&0D00
60[OPT2
70PHA
80LDA#7
90JSR&E0A4
100PLA
110JMP&E0A4
120]
140?&20E=0
150?&20F=&0D
160CALL&8000
>RUN
>
>O.
>
>RUN
0D00          OPT1
0D00 48       PHA
0D01 A9 07    LDA#7
0D03 20 A4 E0 JSR&E0A4
0D06 68       PLA
0D07 4C A4 E0 JMP&E0A4
```

Key Bleeper
by Philip Venables



Nasties

on Spectrum

This program is written in *Basic* although a machine code routine has been used to produce some good sound effects. The programme is not very long so the game is fast! Full instructions are included in the programme.

Variables used
HS —High score
SC —Score
F —Vertical position of alien
P —Horizontal position of alien
S —Colour of alien
A —Horizontal position of player

Graphic symbols A and B have been used for the two types of alien

Line	
35	A
40	B

```
   1 REM ########################
         #### N A S T I E S ####
         #### © Andrew Filby####
         ########################
  10 LET HS=0  GO SUB 9000  LET
A=15
  15 GO SUB 8000
  20 LET SC=0  BRIGHT 1  PAPER 0
 INK 0  BORDER 1  CLS
  21 PRINT AT 15,A, INK 2,"▬"
  22 PRINT AT 21,0, PAPER 6, INK
2,
  23 PRINT AT 0,0, PAPER 1, INK
- SCORE 0      ", FLASH 1,"NASTI
ES", FLASH 0,        "HI";AT
0,27, INK 6;HS
  30 RANDOMIZE    LET S=INT (RND*
6)+3
  35 LET A$="*"
  40 IF S>6 THEN LET A$="*"
  50 LET P=INT (RND*32)
  60 FOR F=1 TO 20
  65 IF ATTR (F,P)=88 THEN GO TO
500
  70 PRINT AT F,P, INK S;A$
  80 LET Z$=INKEY$  IF Z$<>"" TH
EN PRINT AT 15,A,"  "  LET A=A+(
Z$="8" AND A<31)-(Z$="5" AND A>0
)  PRINT AT 15,A, INK 2,"▬"
  90 BEEP .004,F+2
  95 IF ATTR (F+1,P)=66 THEN GO
TO 400
 100 PRINT AT F,P," "
 200 NEXT F
 300 GO TO 30
 400 POKE 32504,70  POKE 32503,1
00  POKE 32500,2  POKE 32525,29
 RANDOMIZE USR 32501  POKE 32525
,28  RANDOMIZE USR 32501
 405 IF F<>15 THEN GO TO 30
 410 POKE 32504,100  POKE 32503,
100  POKE 32506,20  POKE 32500,2
0  RANDOMIZE USR 32501  POKE 325
25,29  RANDOMIZE USR 32501
 450 IF SC<HS THEN GO TO 480
 460 PRINT AT 5,5, PAPER 6, INK
0,"YOU HAVE A HIGH SCORE!"; LET
HS=SC
 480 PRINT AT 10,5, PAPER 7, INK
2,"PRESS ANY KEY TO PLAY"
 481 IF INKEY$="" THEN GO TO 481
 482 BEEP .01,40
 490 GO TO 20
 500 POKE 32503,100  POKE 32005,
2  POKE 32526,20  RANDOMIZE USR
32501
 501 LET SC=SC+5  PRINT AT 0,0,
PAPER 1, INK 7,SC;" "
 505 IF S<>7 THEN GO TO 30
 510 POKE 32004,100  POKE 32503,
100  POKE 32506,8  POKE 32520,25
  RANDOMIZE USR 32501  POKE 3252
5,29  RANDOMIZE USR 32501
 520 LET SC=SC-50  PRINT AT 0,6,
 PAPER 1, INK 7,SC
 530 GO TO 30
8000 PAPER 1  INK 7  BORDER 1  C
LS
8010 PRINT AT 0,8, INVERSE 1,"NA
STIES-© Andrew Filby"
8020 PRINT "The object of the g
ame is to    stop the nasties fr
om hitting   the ground,if you d
o not catch  the nasties then th
ey will      collect on the grou
nd.If a pile of nasties reaches
the height ofyour scoop you loos
e."
8030 PRINT 'The nasties that a
re caught areworth 5 points each
 (*),but the white nasties(*) ta
ke 50 point  away from you."
8040 PRINT '"Use 5   for left and
 8  for right"
8050 PRINT AT 18,5,'Press any ke
y to start'
8060 IF INKEY$="" THEN GO TO 806
0
8070 BEEP .01,10  RETURN
9000 PRINT AT 10,5,"Please wait
a moment"
9001 FOR F=144 TO 145  FOR G=0 T
O 7  READ R  POKE USR CHR$ F+G,R
  NEXT G  NEXT F
9010 DEF FN A(N)=(CODE A$(N)-48
AND CODE A$(N)<58)+(CODE A$(N)-5
5 AND CODE A$(N)>64)
9011 LET A$="F3111900260A3A485C4
F1F1F0EFEEE10ED794310FE2520F41C1
520E6FBC9"
9012 FOR F=1 TO LEN A$ STEP 2  P
OKE 32500+F/2,16*FN A(F)+FN A(F+
1)  NEXT F
9100 RETURN
9900 DATA 102,36,60,90,126,102,3
5,102,129,66,126,60,231,60,36,10
2
```

Nasties
by Andrew Filby

Citadel

on Vic 20

This is a game for a Vic with Super Expander. The player has to defend the citadel from flames, which fall from the sky. To stop the flames, there is a magic shield, which can be put below the flames by use of the joystick. However, if the joystick is not constantly moved from left to right, the shield will shrink and fall.

Program notes

0-70	Define constants
100-295	Move and draw shield
300-400	Select and move flame
410-610	End Sequence
800-880	Unprint old & make new flame
1000 1800	Draw citadel
1880-3999	Define initial variables

```
0 REM CITADEL
1 REM BY STEPHEN LOUGHRAN
10 COLOR14,5 1,0
20 DEF FNR(Z)=INT(RND(1)*Z)
30 N=5:REM NO.OF FLAMES
35 REM PIXEL DECAY RATE
40 NX=2 NY=1
50 GOSUB1000
70 TI$ "000000"
90 REM MAIN LOOP
100 R=RJOY(0) OW=W OY=Y
110 IF(RANDJ)=0THENW=W-NX Y=Y+NY GOTO250
120 IFRAND3 0THEN200
140 IFRAND1ANDY>0THENY Y-PD
150 IFRAND2ANDY<700THENY=Y+PD*2
200 W=W+HD
210 IFW>200THENW 200
220 J J*2 IFJ=16THENJ 4
230 IFY<0THENY=0
250 SOUND0 128+W/2 1,128+(700-Y)/5 5,0,15
270 IFY>700THENY=700
280 DRAW0,0 OW,OYTO0+OW OY
290 DRAW5,0 W YTO0+W,Y
295 IFW<1THENW 1
300 F=FNR(N)
305 P=X(F) Q Y(F)
310 IFP=0ANDQ 0ORROOT(P,Q)<>FCTHEN800
330 Q=Q+PD
340 P P+V(F) IFP>KORP<0THEN800
350 IFROOT(P,Q)<>SCANDROOT(P,Q)<>FCTHEN400
360 POINTFL,P,Q
370 X(F)=P Y(F)=Q
390 GOTO100
400 IFQ<700OR(Q>700AND(P<200ORP>742))THE N800
```

Open Forum

```
[illegible] 190,1
[illegible] IN
[illegible] 'FUTHENT$-MID$(
[illegible] ITHENT$ T$+ S
[illegible]
[illegible] T$(M) > 2)+ MINUTE
[illegible]
?60 IF [illegible] T$ M$+
?70 CH [illegible]
?80 RL [illegible]
490 GU [illegible]
?? [illegible]
[illegible] 2,1
[illegible]
[illegible] 3TO8STEP U5
[illegible] AD PC,1
[illegible] 0,190 I
[illegible]
[illegible] AND(PIUY)0 AND(20) 0THE N600
[illegible]
[illegible]
[illegible] ILAM
810 [illegible] (F)
815 IF [illegible] 0THEN830
820 FOR [illegible] TODY(F)STEP PD POINT0 C,E C
 C D,N(<T
830 IFFHP( 0))0THEN500
840 G FN [illegible] IFG FTHEN840
850 X(F)=X(G) Y(F) Y(G)
860 V(F)=(FNR(12) 4)*H,IFV(F) V(G)THEN880
870 GOTO940
900 REM NEW FLAME
910 X(F) FNR(100) Y(F) FNR(300 ),V(F) (FN
R( ) )*H
920 IFX(F)<100ORX(F)>150THENY(F) FNR(200)
930 X F) X(F)*HG
940 POINTFL,X(F) Y(F)
950 DX(F) X(F) DY(F) Y(F
990 GOTO100
1000 REM INIT
1010 GRAPHICS
1060 REGIONRCOLR(2)0R0
1070 Y 1023 B-512
1100 DRAW1 0 KTO290,885
1110 DRAW1 745,885TOK,K
1 00 CIRCLE3 500 0 230 850 20,30
1300 PAINT1 0 ?
1350 DRAW3 790,885TO290 820
1360 DRAW3 715,885TO745 820
1370 CIRCLE3 500,0,730,850,20,30
1400 PAINT3 500,500
1410 CIRCLE3 500,1510 730,745,80,20
1480 D-3
1490 POINT3 290 820
1510 READX Y
1520 IFX 0THEN0 : GOTO1510
1530 IFX> 0ORY> 0THEN DRAWDTOX-255 850 Y
 GOTO1510
1800 DATA0 50 10,140 20 30 20,40
1810 DATA40,40, 5,2,70,40 70,60,80,60,80
 40,130 40
1820 DATA130 20,40,40 130 20,-5 3
1630 DATA140 20 140,150,160 150 5 1,160
 130,145,130,150,140
1640 DATA140,150, 3,3,140,20,170,13
1650 DATA 5,2,222,180,190,13,210,13,220,
180,220,13
1660 DATA230 13 240,180,200,13,270,13,20
0 13
1670 DATA 5,3,200 20,380,70,390,60, 5,2,
230,80 290 50,-5 3,380 50
1680 DATA330,40, 5,2 270 40 290,30,-5,1-
390,30
1200 DATA 5,3,200,-100 5,0 250 -130 150
 -140
1210 DATA300,-150,100,-160
1220 DATA400,-120
1800 DATA-1,-1
1850 FL-2:S 3
1860 I-0
1870 PO 2 NO PD*2
1880 FC RCOLR(FL)AND7 SC RCOLR(0)
1890 H PD/3
1900 Y 650
1910 POINTS,0,Y
1930 DIMX(N),Y(N) V(N),DX(N) DY(N)
1940 W 50
1950 DRAW5,0 W;YTO0+W Y
2510 RETURN
```

Citadel
by Stephen Loughran

Microradio

GW6JJN

Data repeater

This week Microradio moves to Leicestershire to find the latest breakthrough in the world of Radio-computing The Leicester Repeater Group known more usually as GN3CF has just announced the imminent arrival of an amateur data repeater with the callsign GB3GD It is to be located at a site near Leicester and has been built and financed by radio amateurs it is the first of its kind and will be able to handle two code formats of ASCII as well as normal RTTY

The repeater will regenerate incoming signals instead of the usual method of simply relaying them This means that when an amateur with his computer accesses the repeater his signals will be decoded automatically and then re-encoded and transmitted by the logic at the site Strong and accurate signals will then be transmitted and will cover most of East Central England on the 70cms UHF amateur frequency

There will also be a crosstalk facility which means that RTTY will be converted to ASCII and vice versa This has the effect that people with RTTY can talk to people using just a computer and a computer user can communicate with a station having only radio teletype equipment and no computer The group feel that this facility will make for a closer bond between the computer user and the traditional teletype operator In addition to this mode, there will be two RTTY baud rates and four ASCII baud rates There will be a HELP facility which will cause the repeater to send information regarding the modes available and it is hoped to add at a later date a bulletin board and a computing and information service

It may be possible to give the repeater some real computing power so that it can be accessed and programs can be run This brings us closer to the possibility of intelligent repeaters and packet radio

The logic system of the data repeater GB3GD will be based on a Z80 microprocessor and the group are anxious to hear from people who want to use the repeater people who want more information and any ideas regarding new modes etc Contact them by sending a SAE to GB3CF, PO Box 180, Leicester

It is worth adding at this point that the GB3CF group who built and maintain the famous Charlie Fox repeater are also responsible for GB3GV which is a video repeater for television pictures which has recently come into service as well as a couple of microwave beacons.

Hopefully the data repeater will be in operation when you read this If it is not, then it is not because it isn t ready but because the licence hasn t arrived from the Dept of Trade and Industry It seems that the only thing that holds back the technology these days is the filling in of forms

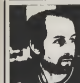
Ray Berry GW6 JJN

This series of articles is designed for radio and microcomputer enthusiasts alike If you have any queries that you want answered hints and tips to share or topics that you would like to see covered write to Ray Berry Microradio *Popular Computing Weekly* 12-13 Little Newport Street, London WC2H 3LD



NOW AT LAST!
Cuthbert
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Cuthbert in Space
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Cuthbert Goes Walkabout
MICRODEAL
Cuthbert in the Jungle
120 SCREENS
MICRODEAL

Tony Bridge's Adventure Corner



Happy birthday!

The Grand Elf's first birthday passed without mention a couple of weeks ago — not even a card! Oh well!

In the first year of the Adventure Corner, a lot of changes have been seen. 1983 has to be the Year of *The Hobbit* as far as I am concerned — this is the program that, in my opinion, changed the face of computer-adventuring more than any program since Scott Adams' *Adventureland* and before that, the original *Colossal Cavern*. In a moment we'll get on to the Hobbit book, but first let's take a look at *Knight's Quest*, by Phipps Associates.

Regular readers may know that this is a particular favourite of mine — whereas *The Hobbit* was revolutionary in bringing sophisticated graphics and language analysis to the popular microcomputer, *Knight's Quest* was the first of the many programs to simplify the approach, and use the techniques in a less complex fashion.

A lot of the pleasure to be gained from K's Q, for me, is the way in which the game grows from a rather innocuous beginning, which may put many people off, to a rich and complex middle and endgame.

A few weeks ago, I looked at some of the opening problems that hold people up. Although it may seem, at times, as if the whole adventure is going to revolve around how to get through the narrow cleft in the rocks, or how to get across the river, this is only scratching the surface.

Guy Nash is having trouble with the grate, which is very early on — try saying *Prise*, Guy! Tommy Agersnap writes to me from Denmark, asking for help in the wasteland. Paul Larcher's mum, is also having trouble there.

'My mother has really got interested in adventure games on my Spectrum (I'd rather have arcade games!). She loves *The Hobbit* and others, but she doesn't seem to be moving anywhere in *Knight's Quest*. She has the Dragon following her, the book of Spells, and the Dwarf as Squire, but she can't get to any location but the wastelands and can't get on with the adventure. Can you help, please?'

K'sQ is a good one to start with, Paul, as it contains many of the problems that you will meet in other adventures. First of all, Mum, try taking another look at that book — it might give you an idea! To cross the river, you will have to get rid of the Dragon — some time ago, I recommended killing it, but I've since found, after reading the Book of Spells, that the Dragon can be put to much better use. Have you managed to explore the location on the other side of the narrow cleft? There you will find, in a casket, the Magic Compass. Now proceed to the wastelands.

You must make a map as you move around, and, if necessary, drop some of the objects that you are carrying, in various places. This will prevent you from going round and round in circles, as you will come across those objects from time to time. There are a couple of objects that you will need to keep with you, the compass being one. This, when you get to the final location in the wastelands, will come to life and give you instructions for your next move. Obey them and you're through! The maze of the wastelands is not randomly generated, so your map will hold good for future games.

More on K's Q next week.

Last week I mentioned the new book from Melbourne House, *A Guide to Playing the Hobbit* by David Elkan (see below). I have since received a pre-publication copy and it will be everything that a frustrated Hobbit will want. It is quite slim (only 75 pages in all), but contains details of every location, along with the illustrations and hints on how to tackle the various puzzles.

The book is divided into three sections: the first is a general guide to playing the adventure, with advice on making maps, reacting with all the various characters, etc.

The next part shows you how to interpret the *Help* clues given to the player throughout the course of the game (the clues here are given, largely, in a "letter-substitution" code, a method which will be familiar to Corner readers!), while the third part is a full reference section listing all the locations, their exits and any other commands you may need to pass certain obstacles.

So this book can be used in a multitude of ways. Newcomers to *The Hobbit* can dip into the text, confident that they will gain useful advice that will not detract from the playing of the classic — while adventurers who may be stuck (in the Goblin's Dungeon?) will find just enough help to nudge them on their way again.

Although short references are made to the behaviour of some of the characters, I would have liked to have seen more detailed discussion on the playing of the adventure — many people, ask, for instance "What is the use of the Golden Key?" and similar questions — a section on various Hobbitbugs would also have been welcome.

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to: Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

50 BOOKS TO BE WON!

Enter our competition by answering the questions below and win a copy of *A Guide to Playing The Hobbit*, by David Elkan, published by Melbourne House. When you have answered the questions, fill in the coupon and send it together with last week's coupon to *PCW*, 12-13 Little Newport St., London WC2 3LD by 10 May 1984. The first 50 correct entries will receive a copy of the book.

1. What is Durin's Day?
2. What is Thorin's last name?
3. Where does Elrond live?
4. What is Gollum's birthday present?
5. What is the answer to this riddle: 'A box without hinges, key or lid, Yet golden treasure inside is hid'
6. Where does Gandalf's cousin, Radagast live?
7. Why did Bilbo name his sword Sting?
8. What is the name of Thorin's father?
9. What is the necklace of Girion, Lord of Dale, made from?
10. What was laid on Thorin's tomb?

RULES
1) Each entry must consist of two coupons
2) Answers must be on a separate sheet of paper
3) No correspondence will be entered into
4) All entries must be received by the closing date 10 May 1984

Hobbit Competition (2)

Name ____________

Address ____________



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Peek & Poke



MIND THE GAP

Richard McCarthy of Llantrithyd, nr Cowbridge, South Glamorgan, South Wales writes

Q I have just finished only half of a game program I have invented, because after 65000 for a line number I get a message *Syntax Error*. I think this is terrible because it means you cannot do very big programs on the Vic. Can I change this?

A I am wondering if you are not getting a little confused. What size gaps are you putting between your line numbers? If you are using a thousand, then this is much too big. Try a hundred, though again, most people would consider this far too high.

Whatever problems with the Vic's memory mapping there might be, I think the situation is not as bad as you suggest. No home computer at all could have a big program by these standards unless they were equipped with banked switching and a large amount of extra RAM. If, for example, you reduced your gaps to a hundred, and used 650 lines, the line numbers would take 12K alone — each address is made up of two bytes. You do not say what size memory expansion you have on your computer, but even if it is 32K this is a large amount to lose in line numbering. Perhaps you do not realise that every single number from 1 to over 64000 can in theory be used. Gaps are only left in programs to make design changes simpler.

The limit of addressing is decided totally by the CPU, on all the common home computers this is 65,535. I would suggest that you keep all the gaps in your line numbers to fifty. This should still be more than enough, and will mean that you will run out of Ram, long before you run out of possible line numbers.

OVER IN A FLASH

Philip Smith, of 16 Belmont Close, Green Lane, Clifton, York YO3 6QR, writes

Q While constructing a maze program for my Spectrum, I came across an annoying bug. When the character came in line with maze graphics, the graphics started flashing. Could you tell me how to get around this?

A The first thing is that this is no bug. It's caused by use of the *Over* command. When you are printing your character, I presume that you are using *Print At x,y,Over 1,* etc. this will cause a flashing effect.

The only way of getting around this problem is either to avoid printing on top of your maze graphics (ie, not let your character move onto it), or not to use overprinting.

IS IT LEGAL?

Michael Stewart of Leeds Road, Bradford writes

Q Am I within the law, swapping commercial programs, in return for others, offered in your classified columns?

A It all depends on how the word trade might be defined in court. On the one hand, many cassettes cannot be sold, lent or hired by way of trade. Barter, when you exchange cassettes, is a form of trade. On the other hand though, the cassette is your own private property and you may do with it as you wish. If you choose to give it to someone who in turn chooses to give you something in return, then gifts (at this level) are not illegal, nor liable to such things as capital transfer tax.

In practice I would doubt that you would get into trouble for simply swopping a cassette you have bought for another. However that means what it says, you must have bought it, and more importantly, the program that might be on it. If you have not then you are swopping a product that does not belong to you in the first place. That is plainly illegal, and would make you liable to penalties under the copyright acts. If you have, for some reasons, bought or swopped an illegal tape, then that is also a crime — even if you did so in good faith.

BLOWING BUBBLES

Phil Strike of Elvedon Way, Maidenhead writes

Q I see, from time to time, references to Bubble Memory. I gather that it has not lived up to early expectation, and will not be readily available for home micros, (I now have a Dragon 64, which is enough new technology to last me a life time). However, would it be possible for you to explain to me what I, and presumably other home users are missing, by not having 'Bubble Memory'?

A Bubble memory was the great revolution in data storage that never quite happened, or at least not to date. The theory and the advantages are sound enough, what has let this form of storage down so far is the practical technology. It is expensive to produce the various driver circuits necessary.

Strictly speaking, Bubble is magnetic data storage media, like tape or a disc, although it looks more like a chip. It works on the theory of magnetic domains or 'bubbles' that are created when special areas have their magnetic fields aligned in the opposite direction to a prevailing one. These are the domains or bubbles and there are thousands of them to the inch. The bubbles are part of a slice of what is, in effect, magnetic tape. Over this is a film, and a series of metal tracks, that control the magnetic fields. You can think of the memory as the shunting of a large number of data trains around numerous loops of track.

Reading the data has to be done sequentially and is determined by the presence of a bubble at a particular place on the loop: yes equals Binary 1, no equals Binary 0. Essentially it is a serial system.

Bubble memory is potentially much faster than Ram but the technology of reading it at the rate it is moved is not yet available so in practice it is much slower and more expensive.

Bubble does have some present day uses, it is less susceptible to heat and climate and can store information in a smaller space than other systems. There are a number of expensive portable business systems that use it.

NEW GRAPHICS

L H Tang, of 51 Elgin Street, Shelton, Stoke-on-Trent, Staffs, writes

Q I own a 16K ZX81 and I am bored of the graphics characters. I would like to know if they can be changed to my design. If this can be done please tell me how this can be achieved.

A Unfortunately you cannot change the character set as easily on the ZX81 as you can on the Spectrum. This is due to the fact that the ZX81 character set lives in the Rom whilst the Spectrum character set lives in the Ram.

Your only options with the ZX81 are either to store your own characters (in an array) and print them, or to buy one of the multitude of Graphics Extension Roms available for the ZX81.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2R 3LD.

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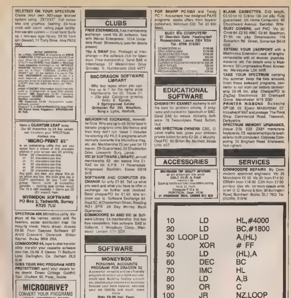
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20      LD     BC,#1800
30 LOOP LD     A,(HL)
40      XOR    # FF
50      LD     (HL),A
60      DEC    BC
70      IMC    HL
80      LD     A,B
90      OR     C
100     JR     NZ,LOOP
110     RET
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For sale

ZX PRINTER paper for sale £8 gets you five rolls, postpaid Mr C Ritchie 40 Kelvinfield Bldgs Kelvindale Road, Glasgow Tel 041 357 2894

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MATTEL AQUARIUS 16K Ram pack game cartridge colour and sound Good condition still boxed cost £120 Swap for 48K Spectrum or 48K Oric or sell for £75 Call after 1pm Newbury (0635) 34520

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QUICKSHOT JOYSTICK for sale! As new four months old perfect working order uses any Atari type socket, £9 Cheques PO s/to R Keld 20 Buckfield Close Ipswich Suffolk

LYNX 48K, boxed with manuals leads printer interface + £35 s/w £100.00 Tel Coventry (0203) 464 732.

48K LYNX, leads, manuals news letters, s/w £110 Duplicate Ace £20 2 books for Oric £5.00 Spectrum s/w games £10 Emigration tradeaside Tel 0385 731898

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TRS 80 model 1 with Interface 48K with Acuate Singly floppy or separate £400 Tel 0538 383547 (day) 0538 386538 (ends)

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PRINTER Trendcom Thermal Printer Good working order with interface suitable for CBM/PET Will swap for something interesting or sell for £45 ono (0244) 676717

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CHANT FOR J-- S-- W-- only 50p from Fleming 33 Cromwell Grove Manchester 19

ALPHACOM 32 printer Hardly used £40 Tel Oxford 770730

T188 CARTRIDGES Soccer T Invaders Munchman A pair of TI Joysticks + Hunt the wompus £30 00 Tel 0234 83353 after 6pm

SHARP MZ80K 48K Epson MX80 F/T Printer with interface s/w inc Crystal Basic + Bug Zen, disassembler Forth £500 00 (might deliver) (0202) 473678.

Wanted

WANTED ACORN Electron up to £150 Tel 01-478 0206 eves only

OVER 100 Spectrum games to swap Send SAE with list or Tel 01-802 2122. Risley 112b Netherwood Rd London N14

WANTED MEMBRANE pad for Spectrum Keyboard Urgent Tel 01966 7566 any time.

WANTED SPECTRUM 48K Issue II £70 Alan Chesham 0494 775810 eves

WANTED KEMPSTON Joystick Interface or Sylden Interface II Will give Spectrum s/w Inc The Quill Zip Zap Zoom and 3D Tanks Tel 01-867 3306 6-8pm only

WANTED dedicated cassette recorder for Commodore 64 and appropriate leads Also wanted Simon's Basic and all accompanying literature Reasonable price Phone 061 733 0090 after 4 except Tuesday Richard

INTERTON VC 4000 Video computer game Wish to exchange for Atari 400/800 after 6pm (021) 748 2416

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WANTED 968 Spectrum and manual No s/w required Will offer up to £100 Tel Welwyn 4225 Ask for Joe Kan (after 4pm)

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SWAP — Casio PB100 P C with 1K Ram Pack boxed as new with Teach Yourself Basic Manual For any Texas TI 99 4A hardware software (new Arcade) Tel 0329 286292 after 6pm

WANTED 48K SPECTRUM with leads and manuals Will pay between £50-£70 Tel 01 572 5582

WANTED DRAGON Hawk or Juniors Revenge in exchange for any of the following Crazy Painter Cuthbert Jungle Ring of Darkness plus free Planet Invasion Ian 3 Birchwood Ave Middlesbro CLeveland TS42XB

96K SPECTRUM s/w to swap Spectrum Chess Dallas Super Spy to swap for The Quill or any other games designer Tel 061 436 7868 after 4pm except on Saturday

SWAP 40 CHANNEL CB Mag mount aerial mike power pack for 16 or 48K Spectrum All worth over £80 Tel after 6pm 0531-4163 (Herefordshire)

SPECTRUM S/W wanted or to swap for King Attick Attack Manic Miner Snooker Chuckegg Football Manager Jetpac + h/w Good prices Please ring Mark McGee at Hay (778680) for details

URGENT SWAP or sale) Atari and six cartridges £89 or swap for any computer (not ZX81) Write or call to Ian Gilligan 100 Pitch Lane Devenel, Liverpool L14 0LD (near Huyton village)

WANTED CASIO VL Tone (any model) Will swap for brand new ZX81 1K and pack and 15 Phone David Tel 0556 72175 (after 4 30pm)

EXCHANGE 40CH CB and accessories and metal detector Both in v g c for 48K issue 2 or 3 Spectrum Must be in good condition (north west) Tel 061 797 5760 eves

KEMPSTON JOYSTICK. I'll swap my Kempston Joystick and interface for ZX Printer Ring David on (0908) 78247

SPECTRUM SOFTWARE To swap for ZX Printer Chess T'Toves Intruders Planetoids Missile H Horace Androids Cruising Jackpot Sorcerers Castle Derbyday Meteor Storm 30 Tanx Softalk Ring Rochdale 50248 Alex 6pm Please

WANTED Ace user magazines and adapter for using ZX81 add-ons on the Jupiter Ace Tel Hull (0482) 847278 (evening)

SPECTRUM TAPES Swap Galaxians Android One Horace Megapede Imagines Orbiter Cookie Transam others Wizards Death Chase Volcanic Planet Push Off Thrusta, Harrier Exterminator Ostron Road Racer Post Firebirds (061 268) 2763

ORIC SOFTWARE to swap 20 titles Arcade Adventure Tel 061 485 6084 after 6pm

WANTED MICRO SPEECH. Swap for Computer Battleship (3 years old) or Electronic Detective Tel 0045 582000

WANTED DRAGON Speech synthesis or sound extension module will swap for other software from large selection of cartridges and cassettes Phone 01-8211710 after 7pm

SWAP 48K Spectrum 127 games Programmable Joystick and Interface leads books magazines and manual Mint condition Boxed Guaranteed for BBC Model B in good condition s/ware not required Tel (0808) 364133

WANTED 48K Spectrum with leads and manuals Good condition Software not needed Will pay between £50-£80 Tel 061-445 5813

WANTED MICRODRIVE + Interface 1 Buy or swap Large selection software + peripherals Currah Kempston Cambridge Interfaces + Quickshot I + 2 286 5381 After 7pm NW8

Wanted Sinclair Spectrum 16K/48K Preferably Boxed with leads and manuals Willing to pay £70 00 Tel Abertillery 213223 eves (Robert)

ADVENTURE HELPLINE

Micro *Spectrum 48K*
Adventure *Escape from Pulsar 7*
Problem *How do you bake the cake How do you get the magnetic boots How do you open the locker?*
Name *Geoff Marshall*
Address *69 Adamsrill Road Sydenham London SE26 4AJ*

Micro *16K Spectrum*
Adventure *Planet of Death*
Problem *I cannot get past the force field I have found the laser gun and typed help on the computer, but simply cannot go not further Please help me!*
Name *Gareth Nelson*
Address *71 Parkinson St, Blackburn Lancs BB2 4BY*

Micro *Vic 20*
Adventure *Pirate Cove*
Problem. *How do I get past the hungry crocodiles if they don't eat the crackers?*
Name *J Wilson*
Address *8 Cloverdale Road, Upper Tulse Hill, London SW2 2DP*

Micro *Vic 20*
Adventure *Adventureland*
Problem *How do I get past the bear without giving him the honey?*
Name *J Wilson*
Address *8 Cloverdale Road Upper Tulse Hill London SW2 2DP*

Micro *Commodore 64*
Adventure: *The Hobbit*
Problem. *I cannot get through the large trap door in the elvenkings cellar I am always thrown back into the dungeon Please help me!!!*
Name *Tim Appleyard*
Address: *453 Chester Road, Woodford Stockport Cheshire SK7 1QP*

Micro *BBC 1B*
Adventure *Castle of Riddles*
Problem *Can not get the bucket out of the mud — so as to bail the water out of the small boat*
Name *Philip Spyrakis*
Address *2 Downside Rd Guildford Surrey GU4 8PH*

COMPUTER SWAP

Computer Swap entries are limited to 30 words Either fill in the accompanying form and send to Computer Swap *Popular Computing Weekly* 12 13 Little Newport Street London WC2R 3LD or telephone 01-437 4343

All software offered through computer swap must be in original condition and for private sale only

Warning: It is illegal to advertise pirated software

COMPUTER SWAP

Please write your copy in capital letters on the lines below

Name ....

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New Releases

WILD CARDS

Given that its main market has been as a business machine there are fewer filing systems available for the BBC than you'd expect Of those that are around there are few with anything approaching the sophistication expected from conventional business systems

Profile from Haiku Soft is one filing system which provides many advanced features In particular, it allows for fields — the various different elements like name, address, telephone number, etc — to be of any length It does not require you to set them up before you start entering data to a regular maximum length — useful because of the often significant saving in memory and the flexibility

The system also has 'wild cards', where the computer can search for a record even if you are uncertain of an exact spelling or only remember part of a name

The version of the program supplied on tape will also function on disc and the manual supplied is one of the best I have seen

Program *Profile*
Price *£19 95*
Micro *BBC*
Supplier *Haiku Software Technology Dragon Gate, 77 St John's Street Hayle Cornwall*

BIT OF BOVVER

I have spoken before of the mysterious Jungian collective consciousness that makes software companies all bring out the same game at the same time

This phase of the moon is bringing forth versions of that strange arcade game where you must dash across a grid (you being a boot) and stomp on a bomb before it does what all bombs almost inevitably do ie, explode

As you tread on each section of grid it disappears — so some thought must be given to the best routes to each bomb There are other features, like skulls and bovver boots to make life even more difficult

Grid Bomb is the latest version of this game and is for the Oric It is true to the original and makes good use of the Oric's sound facilities — there are eight screens of action and the whole thing is in machine code An Atmos version can be confidently expected

Program *Grid Bomb*
Price *£5 95*
Micro *Oric*
Supplier *Touchstone 61 Highfield Road Saxlby Lincoln*

CASH FLOW

Moneybox is a personal finances database program for the Dragon 32 Like most home account type programs it allows a record to be kept of basic financial information — bills, credits, etc

Unlike other systems, records can be analysed in a great many different ways and past information can be used to produce projections into the future

The program is well designed with plenty of prompts and error checking There are fairly substantial instructions on the cassette insert

Program *Moneybox*
Price *£9 99*
Micro *Dragon 32*
Supplier *Harris Software 49 Alexandra Road Hounslow Middlesex TW3 4HP*

INGENIOUS

Goldstar is a new software house who clearly do not believe in doing things by halves — all its programs come beautifully packaged in sturdy boxes rather like those for Betamax Video cassettes

The proof is in the pudding and one of the most interesting of its first releases is an adventure game for the Spectrum called *The City of Ehdollah* (you can tell we're among



computing types here) It is text only and retails for a princely £9 95 — for that money it's going to have to be good

Is it? Well it does not understand complicated sentences and an infuriating number of sensible guesses are met with unhelpful 'I don't know how to ' type answers

On the plus side the first few clues I solved proved to have very ingenious but fair solutions and the place descriptions created a convincing backdrop to the fantasy There is also a facility for real time battles where factors like strength and stamina (largely) determine your success in the various fights I suspect this is one for the purists who enjoy the pure puzzle solving without fancy trappings

Program *The City of Eh dollah*
Price *£9 95*
Micro *Spectrum*
Supplier *Goldstar 1 2 Henrietta Street London WC2E 8PS*

WITCHCRAFT

Spellbound is one of Beyond Software's latest releases and since it's the one you're likely to hear least of in the coming weeks I thought it worth a mention here

It's a version of *Q Bert*, (like so many other games released for the Spectrum recently) but instead of a little man with a big nose it has

CHECK AND MATE

Pick of the week

Colossus Chess 2 0 currently holds the reputation as the best chess playing program on any home micro — the manual contains a long list of the other chess programs it has thrashed (*White Knight Mk II* lost 11 to 5)

More than that (for me anyway) it tells you what it is thinking, thus educating you into chess tactics as it goes along The screen display includes not only the chess board but also chess clocks which is a nice feature I've not seen on other chess programs

The program contains all the other features of conventional chess programs such as, make best move, change sides, position analysis The play can take place in any of six modes which differ in their characteristics — some are good for chess problem solving, others for simple games etc

If you have a Commodore 64 this would seem to be the Chess program to get The price is reasonable too

Program *Colossus Chess 2 0*
Price *£9 95*
Micro *Commodore 64*
Supplier *CDS Microsystems 10 Westfield Close Tickhill Doncaster DN11 9LA*

frogs jumping up and down steps trying to escape from the various unnatural and slimy products of a witch's cauldron

Graphically the game is superb, with large multicoloured graphics — I particularly like the witch whose withered arm zaps additional baddies into existence from time to time.

A couple of small points — the game is not, for some reason, very responsive to joysticks and the movement is a bit jumpy On the other hand the sound effects are marvellous.

Program	*Spellbound*
Price	*£5 95*
Micro	*Spectrum*
Supplier	*Beyond Competition House Farndon Road Market Harborough Leicestershire LE16 9NR*

ASTRO QUEST

Zodiac is the latest Commodore 64 release from Anirog and it is broadly an adventure game in the sense that Ultimate's *Atic Atac* is an adventure game i e an arcade game in which you have to complete a task more like that of an adventure i.e find the twelve symbols of the zodiac scattered around a giant maze

This involves travelling from room to room avoiding the various different kinds of creature all of whom will kill you without so much as a second glance Some of the rooms you come across contain the mysterious symbols

If you collect all twelve symbols then stage two begins You are transported with the symbols to the Time vaults Here you meet JEMON (the capital letters mean he is very dangerous indeed) whom you must avoid whilst placing each symbol in the Central Chamber

Program	*Zodiac*
Price	*£7 95*
Micro	*Commodore 64*
Supplier	*Anirog 29 West Hill Dartford Kent*

JUGGLING

Air Traffic Control is a program for the ZX81 which puts you in charge of up to 15 different planes all flying to the same area of sky

Your task, like juggling with several balls at the same time is to make sure all the aeroplanes don't crash by keeping them on separate paths from one another

In the unlikely event that this all sounds easy, the whole matter is complicated by all the planes flying at different rates and by the extra requirement that you send them all safely off from your area in the right direction for their destinations

Program	*Air Traffic Control*
Price	*£4 95*
Micro	*ZX81*
Supplier	*Hama Software Sackville Place 44-48 Magdalen Street Norwich*

MICRO MUSIC

Now you can use your Spectrum to learn guitar (since playing music is often a lot more satisfying than playing computer games it could put itself out of a job) with *Guitar Tutor 1* from Harlequin software.

The program is divided into three parts, an introduction and tuning guide, a display of the most common chords, and four tunes for you to play and impress your friends

Obviously the big problem with the Spectrum and to a lesser extent the other micros is that you cannot use it to play chords That said though, complete beginners could get something from this program

Program	*Guitar Tutor 1*
Price	*£4 95*
Micro	*Spectrum*
Supplier	*Harlequin Software 43 Osprey Park Thornbury Bristol BS12 1LY*

PARASITES

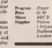
Digger is a sort of *Dig Dug* for the BBC B Your carefully nurtured allotment is attacked by waves of footas and pubars, particularly nasty forms of parasite

You can defeat them by pumping them up — an unpleasant form of revenge in which they explode like baloons, or you can drop rocks on them by careful tunnelling

Not that you have things your own way all the time, on some occasions the beddies turn into fire breathing ghosts with a sideline in gamma rays

The whole game is machine coded with nicely animated characters and good sound effects

Program	*Digger*
Price	*£6 90*
Micro	*BBC B*
Supplier	*Visions 1 Felgate Mews Studland Street London W6 9JT*



SODA SQUIRTS

The Pyramid from Fantasy Software was a game noted not only for its quality but also its quantity — 120 different rooms containing 120 different aliens.

The game is now available on the Commodore 64 and all the features of the Spectrum original have been retained including such masterly inventions as the dreaded squirting soda syphons (the programmers obviously go to the same sort of parties as I do) and the extra-terrestrial tweezers

The order of alien encounter depends on how you leave each previous room ie N,S,E W All the aliens animate appropriately eg, tweezers tweek, syphons squirt, etc Apart from that it's pretty much dodging and destroying all the way One extra touch — it sets up a title page whilst loading, which itself is speeded up considerably — features all 64 games should have as the inscrutable blue screen gets pretty irritating

Program	*The Pyramid*
Price	*£6 50*
Micro	*Commodore 64*
Supplier	*Fantasy Software Fauconberg Lodge 27A St Georges Road Cheltenham Glos GL50 3DT*

New Releases is designed to let people know what software is coming on to the market If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases Popular Computing Weekly, 12 13 Little Newport Street WC2R 3LD



Top 10

BBC*

1	(1)	Mr Wimpy	(Ocean)
2	(3)	Fortress	(Pace)
3	(4)	Daredevil Dennis	(Visions)
4	(2)	Chuckie Egg	(A&F)
5	(6)	3D Space Ranger	(Merstryte)
6	(—)	Twin Kingdom Valley	(Bug Byte)
7	(—)	Slarlock	(Visions)
8	(—)	Laguin	(Software Projects)
9	(10)	Swoop Sally	(Paton)
10	(8)	Cosmic Fla	(Superior)

*All model B

(Figures compiled by Micro Management, Ipswich 0473 59181)

Atari

1	(2)	Warlock	(Calisto)
2	(1)	Rally Speedway	(Adventure International)*
3	(4)	Stinky	(Cosmi)
4	(6)	Caverns of Eriks	(Cosmi)
5	(—)	Fire Fleet	(English)
6	(—)	Vampire Castle	(Adventure International)‡
7	(7)	Preppie	(Advanced International)
8	(—)	Enchanter	(Infocom)†
9	(3)	Saga 8 The Count	(Adventure International)†
10	(—)	Planet Fall	(Infocom)†

*Cartridge †32K disc ‡32 cassette

(Figures compiled by Calisto Computers, Birmingham 021 632 6458)

Spectrum*

1	(5)	Atic Atac	(Ultimate)
2	(—)	Jet Set Willy	(Software Projects)
3	(1)	Chequered Flag	(Psion)
4	(7)	Stock Dive	(Durell)
5	(3)	Hunchback	(Ocean)
6	(8)	Flight Simulation	(Psion)
7	(—)	Pogo	(Ocean)
8	(8)	Lunar Jetman	(Ultimate)
9	(6)	Cyrus Is Chess	(Intelligent)†
10	(2)	Ant Attack	(Quicksilva)

*All 48K except where known †16K

(Figures compiled by WH Smith and Son London)

Books

1	(4)	Disc Systems for the BBC Micro *Sinclair*	(Granada)
2	(2)	Mastering the Commodore 64 *Jones and Carpenter*	(Horwood)
3	(1)	Interfacing Projects for the BBC Micro *Smith*	(Addison Wesley)
4	(—)	A Hardware Guide for the BBC Micro *Carrick*	(Wise Owl)
5	(6)	Introducing Logo, *Allan*	(Granada)
6	(5)	BBC Micro Disc Companion *Latham*	(Prentice-Hall)
7	(3)	Advanced Graphics with the BBC Microcomputer *Angell and Jones*	(Macmillan)
8	(9)	6809 Assembly Language Programming, *Kane and Leventhal*	(Osborne)
9	(—)	MS-DOS Users Guide, *De Voney*	(Que)
10	(6)	*Complete Forth Winfield*	(Sigma)

(Figures compiled by Warlock Technical Books Warlock (0983) 23824 Prestel 35844)
(Last week's position in brackets)

Commodore 64

1	(5)	Manic Miner	(Software Projects)
2	(—)	Quick Thinking	(Mirrorsoft)
3	(—)	Caesar the Cat	(Mirrorsoft)
4	(—)	Hunchback	(Ocean)
5	(3)	Revenge of the Mutant Camels	(Llamasoft)
6	(8)	Mr Wimpy	(Ocean)
7	(—)	Space Pilot	(Anirog)
8	(—)	Ugh	(Softek)
9	(10)	International Football	(Commodore)
10	(2)	Boogaboo (The Flea)	(Quicksilva)

(Figures compiled by Boots/Websters)

Vic 20

1	(1)	Bootball	(Visions)
2	(4)	Flight 015	(Ferranti Davenport)
3	(9)	Wizard and the Princess	(Melbourne House)
4	(—)	Metagalactic Llamas Battle at the Edge	(Llamasoft)
5	(2)	Krazy Kong	(Interceptor)
6	(6)	Jet Pac	(Ultimate)
7	(—)	Emmet Attack	(Commodore)
8	(8)	Grid Runner	(Llamasoft)
9	(—)	Carrier Attack	(Rabbit)
10	(—)	Dambuster	(Rabbit)

ZX81*

1	(1)	Mothership	(Softsynth)
2	(3)	Fantasy Games	(Psion)
3	(5)	Space Raiders	(Psion)
4	(6)	Xadomer	(Quicksilva)
5	(9)	Football Manager	(Addictive Games)
6	(4)	Flight Simulation	(Psion)
7	(7)	Scramble	(Quicksilva)
8	(—)	Invaders	(Quicksilva)
9	(10)	Defenders	(Quicksilva)
10	(8)	Vu-file	(Sinclair)

(Two titles tied for 9th position)
* All 16K

Dragon

1	(5)	Dragon Chess	(Oasis)
2	( )	Ugh	(Softek)
3	(4)	Hungry Horace	(Melbourne House)
4	(1)	Chuckie Egg	(A&F)
5	(8)	Kriegspiel	(Beyond)
6	(3)	Pedro	(Imagine)
7	(2)	Up Periscope	(Beyond)
8	(—)	Space Shuttle Simulator	(Microdeal)
9	(5)	Devil Assault	(Microdeal)
10	(—)	Cuthbert in the Mines	(Microdeal)

Book Ends

SOUPED-UP

Machine Code for the Atmos and Oric 1 is a timely book for those who have recently bought the new souped-up machine

Of introductions to machine code there is little to say — loops, hex, instruction codes, and the rest are introduced and explained

The book makes much use of flow charts and examples (which look suspiciously as though they were type set — very worrying from a reliability point of view) The writing from Bruce Smith is clear and, although I always think machine code is a lot more difficult than book blub would have you believe, quite easy to anderstand

Book	*Machine Code for the Atmos and Oric-1*
Price	*£6 95*
Micro	*Oric 1/Atmos*
Supplier	*Shiva Publishing, 4 Church Lane, Nantwich, Cheshire CW5 5RQ*

XY PLOTTER

Interfacing Projects for the Micro is one of the most interesting computer books I've seen As the title suggests it contains various ideas to connect your micro to the outside world These include a light pen, a rain detector and more impressively, an Eprom programmer and an XY plotter

The real achievement of the book is it's very clear descriptions of what to buy and how to connect it all together, with a photo of what the device should look like Even a complete electrical illiterate should find nothing daunting here

Book	*Interfacing Projects for the BBC Micro*
Price	*£6 95*
Micro	*BBC*
Supplier	*Addison-Wesley, 53 Bedford Square, London WC1*

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
Gamesdope	Arc	Aquarius	£8 95	Fawkes
Smack	Arc	Atari	£8 95	Future Design
3D Tankzone	Arc	BBC	£8 95	Dynabyte
Advanced Basic	Ed	BBC	£19 50	Honeyfold
Assembled Language	Ed	BBC	£12.50	Honeyfold
B Base	Ut	BBC	£25.00	Clares
The Alien Planet	Ad	BBC	£8 95	Honeyfold
Actos +	Ut	Commodore 64	£8 95	Melbourne House
Assembly Language	Ed	Commodore 64	£12.50	Honeyfold
Basic Programming	Ed	Commodore 64	£19.50	Honeyfold
Cosmic Cruiser	Arc	Commodore 64	£5.90	Imagine
Cuthbert goes Walkabout	Arc	Commodore 64	£8 00	Microdeal
Cuthbert in Space	Arc	Commodore 64	£8 00	Microdeal
Cuthbert in the Jungle	Arc	Commodore 64	£8 00	Microdeal
Death Star	Arc	Commodore 64	£8 99	Rabbit
Maziacs	Arc	Commodore 64	£8.95	DK Tronics
The Alien Planet	Ad	Commodore 64	£8 95	Honeyfold
Ace High (MK 2)	Arc	Dragon	£8 95	Tudor
Crazl Plunder	Arc	Dragon	£6.95	Wizard
Decathlon	S	Dragon	£5.95	Wizard
Dodo	Arc	Dragon	£5.95	Blaby
Elmset	Ut	Dragon	£19 95	Microdeal
Juniper	Ut	Dragon	£9 99	Juniper
Mission XK1	Arc	Dragon	£6.95	J Morrison
Planet Conquest	Arc	Dragon	£6.95	Blaby
Starword	S	Dragon	£5.95	Wizard
Strategy	S	Dragon	£6 45	Wizard
The Chocolate Factory	S	Dragon	£6.95	Minits
Sunken City	Ad	Dragon 32	£7 95	Silk
Assembly Language	Ed	Electron	£12.50	Honeyfold
Bridge Player II	S	Spectrum	£8.95	CP Software
Basic Programming	Ed	Spectrum	£10.50	Honeyfold
Count with Oliver	Ed	Spectrum	£7.95	Mirrorsoft
Empires	S	Spectrum	£10 00	Imperial
Engine Collectors	Ut	Spectrum	£3 45	Placet
Forth	Ut	Spectrum	£15 00	Sigma
Halley's Comet	S	Spectrum	£7 95	Eclipse
Look Sharp	Ed	Spectrum	£7 95	Mirrorsoft
Matrix	Arc	Spectrum	£6.95	Salamander
Mission Liat	S	Spectrum	£6.45	Eclipse
Olympics 64	Ut	Spectrum	£14.95	Storm
Psi-Spy	Ad	Spectrum	£7.95	Postern
Alpha Blaster	Arc	Vic 20	£7.95	Sumlock
Assembly Language	Ed	Vic 20	£12.90	Honeyfold
The Alien Planet	Ad	Vic 20	£12.00	Honeyfold
Climber	Arc	ZX81	£4 95	Microdeal
The Temple	Ad	ZX81	£6.95	J Paton

Key Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week All suppliers should send details of their new programs to This Week Popular Computing Weekly 12-13 Little Newport Street, London WC2R 3LD



Ziggurat

The outer limits

I dropped out of hyperspace my gthe returning to their familier positions — hyperspace always leaves me feeling nauseous I flipped the toggle switch controlling the window shields the mechanisms hissed within the skin of the ship and space flooded in through the giant window which covered the starboard wall of the control cabin

At the sight of this deep blackness at the edge of the galaxy vertigo gripped me in its crazy fingers for a moment and my throat crawled like the fur on the back of a cat. I shook my head and swung back round to examine the readout screens in front of me

"Bleak out there " Neep said inside my ear I looked over to the wall bracket where he had attached himself for the duration of the voyage Neep a small Psuedo Conscious Inteligent Construct and my companion for the past year communicated with me by means of a receiver/speaker implanted in my ear and a transmitter/microphone implanted in my throat

"Yes, it scares me this far out, yet I find it exhilarating, I subvocalised The cabin remained quiet "Are you monitoring the displays over here?"

"Yes looks as though that cry for help was no hoax " Neep whispered in my ear I turned to look ota of the wall window and space silently exploded blinding me for a moment.

What the " I swore loudly Then my training asserted itself and I started to subvocalise to Neep "Find out what that was take control of ship systems move us out of here evasive manouveurs if necessary vector us though the nearest gravity well into H-Space " As I spoke the first reports appeared inside my ear

"Warning/attack shot vessels beyond the Forts of Falnon refer to navcom screen Missile type unknown vessels unknown. Evasive manouevring complete Ship intact Scans indicate missile pattern converging Strap down Aereus this is going to be rough Main Sub Light Drive engaging Ignition Gravity Inertia Compensation 7 effective and falling " I ripped the webbed straps from their hooks and pulled them tight over my body as the ship, a Calurian Cannon ship named Hawk plummeted sideways through space As the Gravity Compensation began to fail I felt myself falling towards the wall window

Neep your control " I gasped as madness forced my consciousness away from my brain and down my spine

Light shimmered down a long tunnel peopled with chattering harpies as I clawed my way back to consciousness Aereus are you back?"

"Neep How long?"

"Three minutes that was a bad one "

"Report?" My head felt like the inside of an incinerator

I ve carried out evasive action we are at a safe distance for the moment You really must get something done about that agoraphobia I ve put the Hawk through some tough manoeuvres, the structural integrity is down to 86 and we have no H Space facilities we d break up on entry The alien fleet "

"The what?" I asked — this was getting a little too hairy

"Alien fleet Forty aggressive ships of unknown origin and capabilites beyond the Forts of Falnon The Forts will not be functioning again as defence and refueling stations — they have suffered severe damage There may be no one left alive on them Look at the Shipcom screen for a rerun of some pictures I took while we moved "

I looked down at the screen before me and my hands went cold Sweat broke out on my forhead dripping into my eyes The scene was of the nearest fort a huge grey brown solid H shaped structure, a shadow between me and a mean scattering of stars There were gaping holes in it as though some improbable monster had taken bites out of it, and shards of metal drifted around the Fort rotating slowly

The the camera zoomed in on the docking bay the doors were open and I could see some debris floating around them Closer now I could see bodies adrift in the bay the inner hatchways were gaping wide a little frozen air was smeared on the doors a helmeted figure crossed the screen, the visor red a rip in the side of the suit trailed a string of frozen meat

"Neep, I ve seen enough the distress call that brought us here is it still sounding?"

Mark Eyles

To be continued next week

Puzzle

Throw the dice

Puzzle No 104

It was a rainy day and time to amuse ourselves with a set of dice

"Pick two numbers between 2 and 252 — that s the limit of the game " they said

"Sixty-seven and one hundred and ninety nine " I said

"Now pick up and shake the four dice and throw two of them on the table," they continued I did as they requested

"Now multiply the two numbers together throw the third die and *add* this number thrown " Having done this they instructed me to throw the fourth dice and finally *multiply* by this number

To win the game this final total should be equal to one of the numbers chosen at the outset.

It was only later that I realised that perhaps I had made the wrong choice of numbers What numbers should I have picked?

Solution to Puzzle No 99

The problem can be solved by breaking down each even number (2 to 100) into component primes or as here by summing together every odd prime with every higher odd prime and incrementing an array, by one for every total under 100

The odd primes under 100 are held in a second array P(25) Lines 30 to 54 put the the 25 odd primes into P(1) to P(25)

```
10 DIM A (50) 20 DIM P(25) 30 LET P(1) = 1 31 LET
P(2) = 3 54 LET P(25) = 97 60 FOR N = 1 TO 24 70
FOR M = N TO 25 80 LET S = P(N) + P(M) 90 IF S <=
100 THEN LET A(S/2) = A(S/2) + 1 100 IF S> 100
THEN GOTO 120 110 NEXT M 120 NEXT N 130 FOR N
= 1 TO 50 140 PRINT N * 2 A(N) 150 NEXT N
```

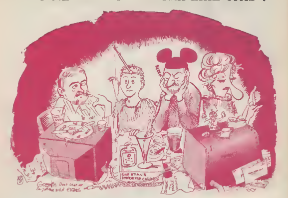
This shows that there are *ten* possible different prime pairs which can be added to form the number 90

Winner of Puzzle No 99

The winner is Iain David Sibley, Neuadd Philip-Evans The Polytechnic of Wales, Pontypridd Mid Glamorgan who receives £10

The Hackers

IMAGINE HAVING TO WORK LIKE THIS !



PROBATION REPORT

It was only a few shorts ago that (from top to bottom) Mel Fagin, Andy Stagg Beetle, Christian-the-Walking-Pillowcase and Lady Clair Sinclive were asked to change their briefs ... "to produce the 69 most unacceptable programs ever."
The tension is beginning to show: their once smiling faces are still smiling, their eyes remain gently closed, Beer and Vodka are beginning to take their dole.
The atmosphere up 'Automata Towers' is a gas; will they suck seed? Can they maintain their insanity? Will they crack under the mental boredom?
Rumours abound that these programs are original, entertaining and value for money... no chance!
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CONSUMABLES TO DATE

Coffee consumed 0 cups (Coffilts reposessed the coffeemachine)
Entire overdraft facility 1
Telephones tapped 353½ (our chief salesman didn't like one of his)

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